

disadvantaged business subcontracting plans are not required for any of the following: (i) small business contractors, (ii) personal service contracts, (iii) contracts that will be performed entirely outside of the United States and its territories, or (iv) modifications to existing contracts which do not contain subcontracting potential.

**25.2.3 Contractor will act in accordance with the subcontracting plan in the performance of the Work and in the award of all subcontracts.**

**25.2.4 The requirements of Attachment 6 and the successful Bidder's response will be incorporated into the CWA and subcontracts.**

**25.3 Injury And Illness Prevention Program** In the performance of the Work or Service, Contractor acknowledges that it has an effective injury and illness prevention program which meets the requirements of all Applicable Laws and regulations, including but not limited to Section 6401.7 of the California Labor Code. Contractor will ensure that any subcontractor (inclusive of all tiers) hired by Contractor to perform any portion of the Service or Work also has an effective injury and illness prevention program. The person with the authority and responsibility for implementing and administering Contractor's injury and illness and prevention program must execute PG&E's Compliance Certificate.

**25.4 Work On PG&E Customer Property.** The following provisions apply to the extent that the Services or Work requires Contractor, consultants, or subcontractor personnel (collectively, "Personnel") to have access to PG&E assets, premises, customer property, or logical access to PG&E data or systems (collectively, "Access").

**25.4.1 Criminal Background Checks.**

(a) Contractor warrants and represents that it will not assign any Personnel to work requiring Access unless Contractor has performed a criminal background check on each such individual (either at the time of hiring or during the course of employment). Prior to assigning work requiring Access to any Personnel with one or more criminal convictions during the last 7 years, Contractor must consider the gravity of the individual's offense, the time since the conviction, the successful completion of parole/probation, the individual's age at the time of conviction, the number of convictions, and the stability of the individual, including favorable work history. Contractor will also consider the relation of the offense to the nature of the work or service the individual will perform.

(b) Notwithstanding the foregoing, Contractor will not, under any circumstances, grant Access to an individual with one or more convictions for a "Serious Offense(s)", which is defined as violent and sex offenses, crimes against children, domestic violence, fraud, theft (including but not limited to identity theft), embezzlement, all felonies during the last 7 years, and/or 2 or more DUIs in the past 3 years.

(c) Contractor will maintain documentation related to its criminal background check investigation for all Personnel requiring Access and make it available to PG&E for audit if requested pursuant to the audit provisions in Section 8.10.

(d) Contractor also agrees to notify PG&E if any of its Personnel requiring Access are charged with or convicted of a Serious Offense during the course of a PG&E assignment.

**25.4.2 Fitness for Duty.** Contractor must ensure that its Personnel granted Access report to work fit for duty. Personnel with Access may not consume alcohol while on duty and/or be under the influence of drugs that impair their ability to work safely. PG&E expects each supplier to have policies in place that requires their employees report to work in a condition that allows them to perform the work safely. For example, employees should not be operating equipment under medication that creates drowsiness. As a federal contractor, PG&E does not recognize or allow work to be completed under the influence of marijuana, whether or not is it used for medical reasons.

**25.4.3 Eligibility for PG&E Work.** When assigning any Personnel to perform Work requiring Access, Contractor will submit each person's full name and the last four digits of their social security number to PG&E at the following e-mail address: RecruitingOperations@pge.com. PG&E reserves the right to decline to accept any proposed Personnel, in which case Contractor will promptly propose a replacement.

**25.5 Compliance With PG&E's Supplier Code Of Conduct.** The supplier code of conduct requires that Contractor and each of its subcontractors (inclusive of tiers) demonstrate a strong commitment to compliance, ethics, sustainability, and supplier diversity as a foundation to successful business. Contractor must complete its Work for PG&E in full compliance with the supplier code of conduct, as it may be modified from time to time. Contractor will access, read and comply with PG&E's supplier code of conduct and will make it available to its subcontractors and suppliers. The supplier code of conduct can be located and downloaded at [http://www.pge.com/includes/docs/pdfs/b2b/purchasing/contractor\\_consultant\\_and\\_supplier\\_code.pdf](http://www.pge.com/includes/docs/pdfs/b2b/purchasing/contractor_consultant_and_supplier_code.pdf) and is hereby incorporated by reference into the Contract Documents.

**25.6 NERC Requirements.** Pursuant to a directive from the North American Electric Reliability Corporation ("NERC"), all employees and contractors with unescorted access to facilities and functions that PG&E deems critical to the support of the electricity infrastructure ("Critical Facilities") must undergo employment background screening and training before being granted access to any PG&E facilities. PG&E has included in the category of those with "unescorted access" all Contractor and subcontractor personnel ("Individual") working within PG&E Critical Facilities. The following requirements apply to any Work subject to the NERC requirements:

**25.6.1** The background screening program for each Individual includes each of the following: (i) Social Security number verification; (ii) county criminal check (up to 3 counties where the applicant /employee has lived in the past 7 years); and (iii) "Global Watch" (check of 19 Federal and International Terrorist Watch lists).

**25.6.2** The NERC directive also requires that the Contractor or subcontractor administer to each Individual with access to Critical Facilities an initial and annual PG&E web-based training session. This training program will also be provided in CD and hard copy format.

**25.6.3** Following conclusion of an acceptable background check and certified completion of the above training courses, the Contractor will provide PG&E's corporate security department with a completion confirmation for each Individual. PG&E will issue each Individual a keycard to access the designated PG&E facility to which they are assigned. PG&E will deny access to Critical Facilities to any Individual who has not passed clearance.

## **25.7 Outsourced Gas Asset Management Activities.**

25.7.1 Contractor and its subcontractors (inclusive of all tiers) and suppliers must comply with the terms and conditions of PG&E's Outsourced Gas Asset Management Activities Program ("OGAMAP") in the performance of all Services and Work performed for PG&E's gas operations organization. The OGAMAP requires that Contractor, subcontractors (inclusive of all tiers) and suppliers demonstrate a strong commitment to gas safety excellence and maintain appropriate controls over the gas infrastructure supply chain. Any Services or Work performed for PG&E must be completed in full compliance with the following, as it may be modified from time to time: (a) PG&E's Code of Conduct for Contractors, consultants, subcontractors, suppliers and vendors as set forth in Section 25.5; (b) PG&E's Gas Asset Management Policy TD-01; (c) PG&E's Gas Asset Management Strategy and Objectives; (d) PG&E's Gas Operations process for raising safety concerns and issues; and (e) all terms, conditions, and specifications for Services or Work set forth in the MSA or any CWA..

25.7.2 Should PG&E require, Contractor, consultants, subcontractors (inclusive of all tiers), suppliers, and vendors will obtain a complete understanding of their role(s) supporting PG&E in a gas emergency. As a reference guide, PG&E will provide Contractor with a copy of PG&E's Gas Emergency Response Plan Volumes 1 and 2 ("GERP") and Gas Safety Plan provided to increase knowledge and understanding of providing a safe, efficient and coordinated response to emergencies affecting gas transmission and distribution systems. These documents provide emergency response guidance consistent with the Incident Command System ("ICS").

25.7.3 Contractor will access and download a copy of PG&E's Code of Conduct for Contractors, consultants, suppliers and vendors at the link provided in Section 25.5. Contractor will receive an email invitation to access PG&E's third party internet site [www.poweradvocate.com](http://www.poweradvocate.com) to obtain access and to download the documents referenced in 25.7.1(b) – (d) and Section 25.7.2.

25.7.4 Contractor represents, warrants, and certifies that Contractor, subcontractors (inclusive of all tiers), suppliers, vendors, and their respective employees performing Work or Services under the MSA and any CWA have been provided, and have reviewed, the above-referenced documents and agree to comply with all terms and conditions contained in those documents.

## **25.8 Document Retention And Production Requirements.**

25.8.1 Contractor agrees to retain all documents and data, whether paper or electronic, created, collected or received for PG&E in the course of performing the Services or Work or furnishing the materials under the MSA or any CWA, including without limitation, documents, data, plans, drawings, diagrams, investigative notes, field notes, tests, photographs, records, calculations, summaries, and reports; provided that Contractor is not required to retain (i) draft versions of final written documents such as reports, presentations, or other written deliverables and (ii) documents that are inconsequential or ancillary to performance and documentation of the a Capital Improvement Project (or Projects) or its deliverables ("PG&E Contractor Documents") as follows:

25.8.2 Contractor will store PG&E Contractor Documents in a secure and organized manner. All PG&E Contractor Documents must be in legible form, whether paper or electronic. In managing and administering PG&E Contractor Documents, Contractor will comply

with the requirements of "The Generally Accepted Recordkeeping Principles®" (see [www.arma.org](http://www.arma.org)), or with modified requirements approved in writing by PG&E.

25.8.3 Upon completion of the Services or Work or furnishing of the materials under the MSA, or upon Final Completion of the Services or Work or furnishing of the materials under each CWA to the MSA, PG&E will specify which of PG&E Contractor Documents must be transmitted by Contractor to PG&E ("PG&E Records"), provided however, unless otherwise agreed by PG&E:

(a) Contractor will transmit to PG&E, or provide PG&E access to, PG&E Records on request within 48 hours or sooner if needed (without limitation) for regulatory, CPUC, safety, audit and/or litigation requirements;

(b) PG&E may specify that PG&E Records be delivered to PG&E on a regular basis prior to Final Completion;

(c) With respect to PG&E Contractor Documents not transmitted to PG&E as PG&E Records, Contractor must retain all such documents for 24 months after the Final Completion ("Retention Period"). During the Retention Period, PG&E Contractor Documents will be retained by Contractor at no additional cost to PG&E until disposed of in accordance with Section 25.8.6 below. To the extent PG&E requests Contractor to retain PG&E Contractor Documents after the Retention Period, the Parties will mutually agree on the terms and conditions of the additional Retention Period;

(d) If PG&E Records are kept in electronic form, the following formats are acceptable for transmission to PG&E: (i) PDF, CAD or TIFF for Drawings and diagrams and (ii) PDF for all other documents. If PG&E Records transmitted to PG&E consist of data in a proprietary format, Contractor will make available to PG&E the proprietary tools or software necessary to access the data including after the transfer of the data to PG&E. This subsection (d) does not abrogate Contractor's obligation to produce PG&E Records in an alternative format (e.g., a native format) if set forth elsewhere in the Contract Documents, in which case Contractor will produce PG&E Records in each of the formats requested.

25.8.4 PG&E Contractor Documents will be treated as confidential and will not be disclosed to others unless Contractor is required to produce the documents pursuant to legal or regulatory requirements, in which case Contractor will give PG&E maximum practicable advance notice before any production.

25.8.5 Contractor will maintain a system for back-up of electronic PG&E Contractor Documents (e.g., files or databases) so they will be preserved for retrieval in case the originals are lost or destroyed.

25.8.6 If PG&E directs Contractor to dispose of PG&E Contractor Documents, Contractor will do so in a confidential and secure manner, whether the format is electronic or paper. Proof of destruction of PG&E Contractor Documents will be submitted to PG&E upon request.

25.8.7 If PG&E provides paper documents to Contractor in order to convert them to digital electronic format, Contractor will return both the paper documents and the documents converted to digital electronic format to PG&E.

25.8.8 Contractor is responsible for ensuring that its subcontractors (inclusive of all tiers) comply with the obligations of Contractor as set forth in this Section 25.8.

## 26. INTELLECTUAL PROPERTY

**26.1 Design Development and Construction Documents.** The design development documents and Construction Documents are developed and furnished for use solely with respect to the Capital Improvement Project or Projects. As such, provided that PG&E has complied with the payment provisions set forth in Article 8, PG&E will own and have all rights, title, and interests under Applicable Law in the Project's overall design, all Drawings and Specifications produced in connection with the Capital Improvement Project, or Projects inclusive of the Construction Documents. The Contractor and its engineers, consultants, subcontractors (inclusive of all tiers), and suppliers will not own or claim a copyright in the design, Drawing, Specification, Construction Documents, or other design documents prepared for the Project, and may not use such documents on other projects other than the Capital Improvement Project (or Projects) without the written consent of PG&E. The Contractor and its engineers, consultants, subcontractors (inclusive of all tiers), and suppliers may retain a record set of each of the Construction Documents for the purpose of defense of any subsequent Claims or disputes arising from the Work.

**26.2 Building Information Model.** The Record Model and subsidiary Building Information Models used for design and construction of a Project are the property of PG&E. The Contractor and its engineers, consultants, subcontractors (inclusive of all tiers), and suppliers agree to provide PG&E, as a deliverable before Final Completion, the Record Model and any other BIM files that PG&E deems necessary. Despite the above, design elements that were created by Contractor or its engineers, consultants, subcontractors (inclusive of all tiers), or suppliers, before execution of the MSA or CWA, as extensions to commercially available BIM software will remain the property of the respective party that created the extension, regardless of whether it was used in a Model for Work performed under the MSA or CWA, and PG&E will hold a perpetual, non-exclusive, royalty-free license to those design elements for purposes of designing, constructing, operating, and maintaining the Capital Improvement Project (or Projects) for which the Record Model was created.

**26.3 Licensing.** The Contractor and its engineers, consultants, subcontractors (inclusive of all tiers), and suppliers are each granted a limited, non-exclusive, royalty-free license to use and reproduce applicable portions of the Construction Documents and other Drawings, Specifications, and documents prepared for use in the performance of the Work. PG&E grants the Contractor and its engineers, consultants, subcontractors (inclusive of all tiers), and suppliers a non-exclusive, royalty-free, perpetual license for use or display of the BIM or 2-D information solely for educational purposes, and the BIM may be used for promotional purposes upon written approval by PG&E.

**26.3.1 Copies.** All copies made under the license will bear the statutory copyright notice, if any, shown on the Construction Documents and any other Drawings, Specifications, or other documents prepared by the Contractor and its engineers, consultants, subcontractors (inclusive of all tiers), and suppliers in connection with the Capital Improvement Project (Projects). Submittal or distribution to meet official regulatory requirements or for other purposes in connection with a Capital Improvement Project (or Projects) will not be construed as publication in derogation of PG&E's copyright or other reserved rights and interests.

**26.4 Exception.** Nothing contained in Article 26 limits the rights, title, and interest of the Contractor and its engineers, consultants, subcontractors (inclusive of all tiers), and suppliers to continue to use their respective general design details that each of them uses or has used on multiple projects, or new standard design details that were developed during design under the MSA or CWA.

**26.5 Termination.** Termination of the Contractor or its engineers, consultants, subcontractors (inclusive of all tiers), or suppliers does not affect the rights of PG&E under this Article 26. However, if a Capital Improvement Project (or Projects) is terminated for convenience before approval of Construction Documents and PG&E later proceeds with the Work and uses design materials prepared by Contractor or any of its engineers, consultants, subcontractors (inclusive of all tiers), or suppliers for continuation of the Capital Improvement Project (or Projects) with different design and construction professionals, then PG&E will release, indemnify, defend, and hold harmless the terminated parties (as applicable) from any liability arising from PG&E's further use of the design materials.

**27. DISPUTE RESOLUTION.** This Article 27 addresses the procedures for resolving disputes between PG&E and Contractor that arise out of or relate to the MSA or CWA.

**27.1 Statement of Claim.** A Party may initiate the dispute resolution procedures stated in this Article 27 by providing notice to the other Party. All Claims must include a detailed factual narrative of events fully describing the nature and circumstances giving rise to the Claim, including but not limited to, necessary dates, locations, areas of the Capital Improvement Project (or Projects) that are impacted or affected Work or Services, and a detailed breakdown of the amount of damages or cost associated with the Claim. If the Claim is being made by the Contractor as a result of a disputed change order request, Contractor's notice must include a detailed breakdown of the amount of money being claimed or the number of days of extension requested and justification for same pursuant to Section 8.10, as well as certification that the Claim is made in good faith, and a statement demonstrating that the Claim is being timely submitted pursuant to the relevant provisions of the Contract Documents. Any of Contractor's consultants, engineers, contractors, subcontractors (inclusive of all tiers), or vendors that are included in the Claim and claiming not less than 5% of the total monetary Claim must also submit a certification that their respective portion of the Claim is made in good faith.

**27.2 Notice.** The statement of Claim per Section 27.1 must be submitted to the other Party as soon as possible but not later than 30 calendar days after discovery of the occurrence or event giving rise to the Claim, unless the Parties mutually agree to a longer period of time, in writing, due to the nature and complexity of the Claim. Failure to provide notice will constitute a waiver of Claim. Under no circumstances will a Claim be made if it is barred by the applicable statute of limitations or repose.

**27.3 Continued Performance.** At all times during the pendency of a dispute or a dispute resolution proceeding, Services and Work will continue. If PG&E continues to comply with its payment obligations per Article 8, the parties to the dispute resolution proceeding will continue to comply with any PG&E directives or orders.

**27.4 Executive Negotiations.** The dispute will first be addressed in a negotiation between a Vice-President of PG&E (or his or her designated representative) and a Contractor executive of similar authority. Such negotiation will occur within 15 days after it is first requested in writing by either Party. The executives will meet at a mutually acceptable time and

place, and thereafter as they deem reasonably and mutually necessary, to exchange information and to attempt to resolve the dispute.

**27.5 Mediation.** If the dispute has not been resolved within 30 days of the first meeting of the executives, then the dispute will be addressed in a mediation requested in a written notice by either Party. Both Parties to the dispute will attend and participate in the mediation, which will be non-binding and without prejudice to any other rights or remedies that either Party may have. Unless both Parties to the dispute agree otherwise, the mediation proceeding will be conducted by an independent mediator from either the offices of the American Arbitration Association ("AAA") or Judicial Arbitration and Mediation Services ("JAMS") in San Francisco, in accordance with the selected forums procedures, and will occur within 60 days of the written initiating notice. The costs of the mediation will be shared equally by both Parties. Any voluntary settlement reached as a result of the mediation proceeding will be reduced to writing.

**27.6 Confidentiality of Dispute Resolution Process.** All negotiations and any mediation conducted pursuant to this Article are confidential and subject to Sections 1119 and 1152 of the California Evidence Code, which code sections are incorporated by reference into the Contract Documents.

**27.7 Binding Arbitration.** If the dispute is not resolved within 30 days after the conclusion of the mediation, then the dispute will be resolved in an arbitration to be conducted in accordance with the terms set forth in this Section 27.7, which arbitration can be initiated by either Party. All Parties to the dispute will attend and participate in, and will be bound by the results of, the arbitration proceeding. The arbitration will be conducted by JAMS in accordance with JAMS Engineering and Construction Arbitration Rules then in effect, as supplemented by the terms of this Section. Proceedings for Claims in the amount of \$1,000,000 or less may be held before a single arbitrator who is acceptable to both Parties. Claims exceeding \$1,000,000 will be held before a panel of 3 arbitrators. The arbitrators will be selected from a list of potential arbitrators provided by JAMS. In the case of 3 arbitrators, PG&E will select one arbitrator and Contractor will select the second arbitrator. The two selected JAMS arbitrators will agree to a third arbitrator. All arbitrators must have 10 years of relevant experience in design and construction matters. All arbitrations will be held in the JAMS San Francisco office. The parties to the dispute will bear the arbitration fees and costs equally. Unless otherwise agreed to by the Parties, the arbitration must be concluded within 180 calendar days after exchange of detailed statements as required under Section 27.7.1 and the final award will be conclusive and binding. Judgment upon award may be entered and enforced in the appropriate state or federal court having jurisdiction over San Francisco County, and is only subject to challenge on grounds set forth in California Code of Civil Procedure section 1285, et seq. and 9 USC sections 10-11 (as applicable). The arbitrator will have the power to grant all legal and equitable remedies available to the parties under California state or federal law (as applicable); however, under no circumstances will the arbitrator be empowered to award punitive damages. The final arbitration award will state all findings of fact and conclusions of law based on Applicable Law.

27.7.1 The parties to the dispute will exchange detailed statements of Claims and counterclaims by an agreed upon date or as determined by the Arbitrator(s). The 180 day period for the arbitration will commence after the exchange and filing of the arbitration Claim.

27.7.2 The exclusive forum for determining whether a Claim is subject to arbitration under the MSA and applicable CWA is the Superior Court of the State of California.

**27.8 Subcontract and Consulting Agreement Dispute Resolution.** Contractor will incorporate all of the terms of this Article 27 (Dispute Resolution) into its subcontracts and consulting agreements so that all engineers, consultants, and subcontractors (inclusive of all tiers) will also be bound to this dispute resolution procedure. PG&E will have the right, but not the obligation, to consolidate all Services or Work related disputes, whether involving the Contractor and/or any engineers, consultants, and subcontractors (inclusive of all tiers), into a single consolidated proceeding.

**27.9 Preliminary Injunction.** Notwithstanding the foregoing dispute resolution provisions, a Party may seek a preliminary injunction or other provisional judicial remedy if in its judgment such action is necessary to avoid irreparable damage or to preserve the status quo.

**27.10 Enforceability.** The Contractor has reviewed the dispute resolution procedures with legal counsel and agrees to the terms and conditions set forth in this Article 27. To the extent a court of competent jurisdiction finds any term or provision in this Article 27 to be void or unenforceable, the unenforceable term or provision will be severed and the remainder of the terms and provisions will remain in full force and effect. Performance of the MSA and CWA will continue during any dispute (including during arbitration), provided that performance of the Service or Work in dispute will only continue if and in the manner PG&E directs. Nothing contained in this dispute resolution process prevents Contractor or its engineers, consultants, or subcontractors (inclusive of all tiers) from timely filing a civil action to foreclose on a mechanics lien or stop payment notice. However, the Parties agree to stipulate to a stay in the proceedings pending attempts to resolve the matter pursuant to the process defined in this Article.

## 28. TERMINATION AND SUSPENSION

**28.1 Suspension.** PG&E may suspend the Service or Work, or any part of the Service or Work, at any time and without cause upon written notice to Contractor. The written notice will set forth the reason for suspension, the Service or Work suspended, and the effective date of suspension. Upon receipt of notice of suspension, Contractor will, at PG&E's expense, comply with the terms of the notice, and take all reasonable steps to minimize costs allocable to the Service or Work covered by the notice. If the Service or Work is suspended, or if the portion of the Service or Work that is suspended impacts the critical path of the Schedule, then the Contract Time and Contract Price may be adjusted through Change Order per Section 7.5.5 and Article 9.

**28.2 PG&E's Termination for Convenience.** PG&E may terminate the MSA or any CWA for convenience upon 10 calendar days' written notice at any time before completion of the Service or Work. The notice will state the extent and effective date of termination, and on the effective date, Contractor will: (i) to the extent directed, stop the Service or Work as required in the notice; (ii) terminate or assign all subcontracts, purchase orders, and consulting agreements to PG&E unless otherwise directed; and (iii) take other actions as may be necessary or requested by PG&E to protect and preserve work product produced during Services, the construction work, and any other property in Contractor's possession in which PG&E has or may acquire an interest. Upon termination, PG&E will pay Contractor all reimbursable expenses incurred per Section 6.4 as of the effective date of termination (including reasonable expenses related to demobilization, protection, and preservation of the construction work, and securing the job site) plus Fee earned based on the portion of Service or Work properly completed. Contractor expressly waives any Claims for consequential damages, including anticipated lost profits. All payments under this Section are subject to the payment provisions in Article 8, and any dispute over the amount to be paid upon termination will be

resolved under the dispute resolution procedures in Article 27. Upon such termination, the obligations of the Contractor will continue with respect to portions of the Service or Work already performed and termination of Contractor does not affect the rights of PG&E under Article 26, or elsewhere in the Contract Documents.

**28.3 PG&E's Termination for Cause.** PG&E may terminate or suspend in whole, or in part, the MSA or a CWA for cause if any of the following conditions occur: (i) persistent or repeated failure of Contractor to provide skilled personnel, an adequate supply of skilled labor, materials, equipment, and other resources necessary to properly complete the Service or Work; (ii) refusal by Contractor to rectify Services or Work that is not in accordance with the Contract Documents; (iii) failure of the Contractor to collaborate with PG&E for the benefit of the Capital Improvement Project (or Projects); (iv) failure of Contractor to timely and properly pay its consultants, subcontractors (inclusive of all tiers), suppliers, and equipment vendors; (v) Contractor's repeated failure to comply with Applicable Law or applicable code requirements; (vi) bankruptcy or insolvency; or (vii) breach of a material term of the Contract Documents after receiving notice from PG&E and an opportunity to cure and Contractor has failed to do so; or (viii) in PG&E's opinion, the Work will not be completed within the Contract Time and PG&E has requested Contractor to take steps necessary to accomplish the required progress and completion, and Contractor has failed to do so.

**28.3.1 Remedies.** If PG&E terminates Contractor for cause, Contractor will not be entitled to receive any further payments until 35 calendar days after Final Completion, and only to the extent that the cost of completing the Service or Work (inclusive of all costs, expenses, and damages arising from Contractor's default) does not exceed the Contract Price. Upon request from PG&E, Contractor must remove materials, supplies, equipment, tools, and construction equipment and machinery from the job site within 5 business days of such request; and if Contractor fails to do so, PG&E may remove or store at Contractor's expense, and after 90 days sell, any of the same at Contractor's expense. In addition, PG&E may, without prejudice to any other rights or remedies, and after giving Contractor (and its surety, if applicable) prior written notice per Section 28.3: (i) take possession of any intellectual property per Article 26, the site, and of all materials and equipment procured for the Capital Improvement Project (or Projects); (ii) accept assignment of any consulting agreements, subcontracts, purchase orders, and equipment rental agreements; (iii) finish the Service or Work by whatever reasonable method PG&E may deem expedient; and (iv) pursue any Claim against Contractor for damages under Article 27. Termination of Contractor does not affect the rights of PG&E under Article 26.

**28.4 Contractor's Termination for Cause.** Contractor may terminate a CWA for cause upon 30 calendar days prior written notice and an additional 10 business days to cure if any of the following occur: (i) PG&E fails to pay undisputed amounts due pursuant to Article 8; (ii) PG&E suspends a Capital Improvement Project for more than 180 consecutive days under Section 28.1 after the construction work has commenced. The effective date of termination will be 30 calendar days from the date of the notice, unless PG&E has commenced curing, in which case Contractor may not terminate for cause.

**28.4.1 Remedies.** Upon termination, PG&E will pay Contractor in accordance with the payment provisions set forth in Section 28.2. All payments under this Section are subject to the payment provisions in Article 8, and any dispute over the amount to be paid upon termination will be resolved under the dispute resolution procedures in Article 27.

**28.5 Conversion to Termination for Convenience.** If an arbitrator or court of competent jurisdiction deems that termination of Contractor was wrongful or otherwise improper, the termination will be deemed a termination for convenience under Section 28.2. Payment will include 5% simple interest per annum, on the difference between the amount that was paid at the termination and the amount that should have been paid for a termination for convenience. Interest will accrue from the effective date of termination.

## 29. MISCELLANEOUS PROVISIONS

**29.1 Notice.** Any notice required to be given by the MSA or CWA will be in writing and deemed effective upon personal delivery, or 1 business day after being sent via registered or certified mail return receipt requested or by overnight commercial courier providing next business day delivery and addressed to the PG&E representative or the Contractor's representative identified in the CWA.

**29.2 Governing Law.** The MSA, CWA, and other Contract Documents will be governed and construed in accordance with the laws of the State of California without regard to the principles of the conflict of laws. The Parties agree that any Claim or enforcement of a judgment or alternative dispute award will be filed with the appropriate court of law in the county where the Capital Improvement Project (or Projects) is located.

**29.3 Commencement of the Statute of Limitations.** Causes of action between the Parties pertaining to acts or omissions arising out of performance of the Services or Work or related to the Contract Documents will be deemed to have accrued and the applicable statutes of limitations will commence to run not later than either the date of Final Completion of the Project or the date of a recorded notice of completion, whichever is later.

**29.4 Time is of the Essence.** Time is of the essence with respect to each and every provision of the MSA, CWA, and other Contract Documents and any subsequent modification through executed Amendment or Change Order.

**29.5 Assignment.** PG&E and Contractor, respectively, bind themselves, their partners, successors, assigns and legal representatives to the other party to the MSA and CWA and to the partners, successors, assigns, and legal representatives of the other Party with respect to all covenants of the MSA and CWA. Neither PG&E nor Contractor will assign the MSA or CWA without the written consent of the other, and such consent will not be unreasonably withheld or delayed.

**29.6 Confidentiality.** Contractor and its consultants and subcontractors (inclusive of all tiers) will keep all Services and Work performed for PG&E under the Contract Documents confidential and will only provide information regarding the Services or Work to other persons or entities as reasonably necessary for performance of the Services or Work.

**29.7 No Publicity.** Contractor will not include PG&E's name, any reference to the MSA or a CWA, or any reference to PG&E's purchase or use of any products or services provided by Contractor in Contractor's published customer list or in other publicity or advertisement (including Contractor's internet site(s)) or social media without the prior written consent of an officer of PG&E. The fact that the Parties have entered into an MSA does not constitute, or imply in any way, an endorsement of Contractor by PG&E, and Contractor will not state or imply that PG&E endorses, recommends, or vouches for Contractor in any form of

written, verbal, or electronic advertisement, communication, or any other business development effort.

**29.8 Proprietary Information.** Information provided by PG&E or made available to the Contractor or its engineers, consultants, subcontractors (inclusive of all tiers), or suppliers during performance of the Services or Work will not be disclosed to persons or entities other than as necessary to perform the necessary Services or Work required for the Project.

**29.9 Interpretation and Severability.** The terms and conditions of the MSA and CWA will be interpreted in accordance with their plain meaning, and not strictly for or against either Party. Any rule of construction or interpretation to the contrary will be of no force or effect with respect to the MSA or CWA. If a court of competent jurisdiction finds any term or provision of the MSA or CWA to be void or unenforceable for any reason, that term or provision will be deemed severed and the remainder of the MSA or CWA will remain in full force and effect according to its terms and provisions, to the maximum extent permitted by Applicable Law.

**29.10 Third Party Beneficiaries.** Nothing contained in the MSA or CWA creates a contractual relationship with, or a cause of action in favor of, a third party against PG&E. The Parties acknowledge and agree that the obligations of the Contractor are solely for the benefit of PG&E and are not intended in any respect to benefit any third parties.

**29.11 Mutual Waiver of Consequential Damages.** Notwithstanding anything to the contrary, to the maximum extent permitted by Applicable Law, neither PG&E nor Contractor will be liable in contract, tort (including negligence), equity, or otherwise, for any indirect, incidental, special, consequential, punitive, or exemplary damages regardless of whether the Parties have been advised of the possibility of such damages, including but not limited to, loss of use, profits, or unrecovered overhead and commitments to third parties, such as subcontracts, rental or lease agreements, and personal services contracts, unless expressly authorized in advance in writing and specifically assumed by a Party, provided that, Contractor shall indemnify PG&E per Section 10.1.7 to the extent PG&E is deemed liable for such damages, by final order of a court of competent jurisdiction, pursuant to the terms of PG&E's applicable regulatory tariff, but only to the extent such liability is ruled by such court as a result of Contractor's actions.

**29.12 Limitation of Liability.** Contractor's maximum liability under any CWA is the greater of either 2 times the Contract Price of the CWA or \$10 Million except as provided in this Section 29.12.

- 29.12.1 Contractor's defense and indemnification obligations under Article 10.
- 29.12.2 A breach of the confidentiality provisions set forth in Section 29.6.
- 29.12.3 Willful misconduct or fraud.
- 29.12.4 Liquidated damages per Section 7.9 and the applicable CWA.

**29.13 Rights and Remedies.** All rights and remedies under the Contract Documents will be cumulative and in addition to, and not in limitation of, all other rights and remedies of the Parties under the Contract Documents or otherwise available at law or in equity.

**29.14 Survival.** The following provisions will survive the termination of the MSA or CWA or Final Completion: (i) Sections 2.3 and 2.4, and (ii) Articles 5 through 11 and 17, 25 through 29.

**29.15 Waiver.** No action or failure to act by PG&E or Contractor will constitute a waiver of any right or duty afforded them under the MSA or CWA, nor will such action or failure to act constitute approval of or acquiescence in a breach of the MSA or CWA, unless specifically agreed to in writing.

**29.16 Counterparts.** The MSA and CWA may each be executed in counterparts, each of which will be deemed an original, and all of which when taken together will constitute one instrument.

**29.17 Interest.** Payments due and unpaid under the Contract Documents will bear interest from the date payment is due either at an annual rate equal to the most recent prime rate published by the Wall Street Journal or at 4% per annum, whichever is less.

**29.18 Legal Citations.** Legal citations to statutory requirements are included in the Contract Documents for convenience and an omission of any statutory requirement will not relieve the Contractor or any of its engineers, consultants, subcontractors (inclusive of all tiers), or suppliers from compliance with Applicable Law.

**29.19 Attachments and Exhibits.** The Attachments listed in the Table of Attachments set forth in the MSA and the Exhibits listed in the Table of Exhibits set forth in the CWA, whether attached at the time of execution or added by Amendment signed by the Parties, are incorporated into the MSA and CWA by reference as though set forth in full.

**29.20 Entire Agreement.** The Contract Documents, inclusive of all Attachments and Exhibits, incorporated under Section 29.19, constitute the entire integrated contract between the Parties and supersede all prior oral and written negotiations, representations, or agreements by the Parties with respect to any Work or Service.



## **SPECIAL CONDITIONS**

## **ATTACHMENT 2**

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Attachment 2, MSA 4400010156  
11666952.4



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## 1. DEFINITIONS

1.1 The following definitions are in addition to the definitions provided in the General Conditions (Attachment 1, MSA).

1.1.1 **"Request For Information" or "RFI"** - any environmental, operational, safety or technical request for information or notification to PG&E or the Engineer of Record. RFIs will include sketches and photos of the specific technical issue, Contractor's proposed solution and the associated cost estimate.

## 2. PURPOSE

2.1 The purpose of this Master Service Agreement (MSA) is to:

2.1.1 Support engineering, procurement and construction of Capital Improvement Projects to improve the capacity, integrity and operating safety of PG&E's electric and natural gas transmission and non-nuclear power generation facilities.

2.1.2 Mitigate the risk of availability of sufficient engineering and trade labor and supervisory resources.

2.1.3 Complete a variety of Work as described in each CWA in a manner aimed at achieving best value based on the Agreed Program, optimal design, increased labor efficiency, and elimination of waste and re-work through utilization of Lean project delivery methods and Building Information Modeling ("BIM") as described in Article 15 and 16 of the General Conditions (Attachment 1, MSA).

## 3. VALUES

3.1 In addition to the LEAN principles described in Article 15 of the General Conditions, the Contractor will, in collaboration with PG&E:

3.1.1 Commit to safety in Work performance.

3.1.2 Complete assigned Work in a workman like manner that meets or exceeds the Specifications and needs of the overall electric, gas and non-nuclear power generation system.

3.1.3 Actively collaborate with other Project Team Members to achieve the Agreed Program.

3.1.4 Have transparency with respect to actual cost and build-up of labor rates and agreed billable rates to help ensure that both Parties are achieving reasonable financial performance.

3.1.5 Develop capacity to enable the Parties to perform larger quantities of Work through additional engineering and field personnel capacity, as well as improved operational efficiency and knowledge of personnel working on the Projects.



3.1.6 Engage in prompt, full, fair, and collaborative dispute resolution per Article 27 of the General Conditions to allow for a stable and mutually beneficial relationship.

3.1.7 Develop and maintain a culture of trust, mutual respect, and acceptance of responsibility.

#### 4. GOALS

**4.1** The Parties will endeavor to complete all Projects for PG&E's electric operations, gas operations and power generation lines of business while enhancing:

4.1.1 Safety of PG&E and Contractor personnel and public during Work performance.

4.1.2 Quality of the Work to meet or exceed the established standards and regulations.

4.1.3 Cost effective completion of engineering, procurement and construction activities, including measures aimed at continuous improvement on a unit basis over time.

4.1.4 Schedule commitments through increased capacity combined with improved operational efficiency of engineering, procurement and construction activities.

#### 5. GOVERNANCE

5.1.1 No later than 30 calendar days following contract award, PG&E and Contractor will meet to establish a plan for combined organization structure that can effectively plan, award, perform and monitor Work performance. This combined organization structure ("Work Governance Organization") will consist of an Executive Steering Committee, a Steering Committee, and Project Team Members as described below:

5.1.2 The Executive Steering Committee ("ESC") will provide senior management for a Capital Improvement Project and an initial level of dispute resolution per Section 27.4 of the General Conditions (MSA, Attachment 1). The Executive Steering Committee will consist of Vice Presidents from PG&E's business lines as appropriate and the President and or Vice Presidents from the Contractor. The ESC will meet on a quarterly basis for normal business environments or as needed to resolve challenges associated with the Work.

5.1.3 The Steering Committee ("SC") will provide management-level guidance for collaborative planning, design, and construction consistent with the Contract Documents using Lean project delivery tools. The SC will consist of the appropriate PG&E management level personnel, and the appropriate management personnel for the Contractor. The SC will manage and coordinate achievement of the Agreed Program, and provide direction to the Project Team. Each SC member must have the authority to make decisions on behalf of its entity and must participate reliably throughout the Work by providing dependable commitments, promises, and information in the best interest of the Capital Improvement Project. The SC will meet on a monthly basis for normal business environment or as needed to resolve challenges associated with the Work.



5.1.4 Project Team Member interface will occur daily throughout the Capital Improvement Project to ensure effective and efficient operations. The Project Team Member interface will include technical, financial, contractual, and operational perspectives as needed.

## 6. OPEN BOOK PROCESS FOR ALL COMPENSATION MODELS

6.1 With respect to all compensation models as further defined in Section 6.3 of the General Conditions (Attachment 1, MSA), and in order to establish agreed rates for all Work performed under the MSA, the Parties agree to follow an open book process as further described below.

6.1.1 The Contractor will be transparent with PG&E in development of the Contract Price and will accurately document detailed accounts for each Capital Improvement Project demonstrating proper financial management and verification of Work performed under a CWA through generally accepted accounting practices.

6.1.2 The Parties will commit reasonable time and resources as necessary to understand any information, analysis and methodology contained in the documentation related to the Contract Price build-up.

6.1.3 In development of the Contract Price, the Contractor will make all records and other documentation related to the build-up of the Contract Price available to PG&E on request and in whatever form reasonably requested. All labor rates, billable rates, multipliers, and equipment rate build up's must be agreed to by PG&E before execution of the CWA.

(a) To attain the necessary level of clarity to develop a fair and transparent Contract Price, PG&E will use the rates solicited and negotiated during the procurement process and that are now set forth in Attachment 3A to the MSA. In addition, Contractor will utilize: (i) an agreed level of accounting; (ii) rates using the information currently in Attachment 3A to the MSA, (c) any multipliers that have been used to account for overhead and profit included in agreed billable rates for Services, (d) the percentages of overhead for construction work, subcontractor mark-up, and Fee; and the estimation methodology to be used to estimate the Work. These agreed rates and multipliers must be effective for the term of the MSA and will be used as a basis for formulating the Contract Price for each Capital Improvement Project awarded under a CWA. Agreed billable rates for professional personnel performing Services and Contractor's employees that are not providing field labor as defined in Section 6.4.1 (c), are subject to an escalation multiplier that will be used as a cap for annual increases to the agreed billable rates. Beginning January 1 of each year of the contract term, all approved billing rates for professional personnel performing Services and Contractor's employees that are not providing field labor shall be adjusted in an amount greater to 2.75% or the Annual Consumer Price Index for Urban Wage Earners and Clerical Workers in the West Region as determined for the sub-category services less medical care services. The maximum increase for each year of the contract is 5%.

(b) The Parties will each independently prepare a Contract Price build-up worksheet for the Work contemplated using the rates in Attachment 3 to the MSA and subcontractor invoices to justify the Contract Price for the Work contemplated under the CWA. The Parties will make every reasonable efforts to substantiate all anticipated reimbursable costs as defined in Section 6.4 of the General Conditions included in the Contract Price build-up and will include margins for labor and material escalation and contingency, plus home office



overhead as defined in Section 6.4.6, plus Fee. Upon PG&E's request Contractor shall also supply to PG&E a complete bottom-up estimate or quotations for the Work. Once the Parties have each developed the Contract Price build-up, they will exchange electronic copies, in native file format, including all supporting documentation, for examination and review by the other Party. Each Party shall make available to the other Party such personnel and further information, as reasonably necessary to answer questions regarding the Contract Price build-up. In addition, Contractor and PG&E will separately identify contingent risks and the anticipated costs associated with those risks in their Contract Price build up worksheets. Each contingent risk must include: (i) the description of the risk, (ii) a financial estimate of the impact of the risk if it occurs; (iii) the probability score of the risk occurring (score low 1 – high 3), the impact score should the risk actually occur (score low 1 – high 3); (iv) the sum of the probability and impact risk scores; (v) a listing of the risk mitigation measures; and (vi) a listing of risk contingency alternative measures.

(c) The Parties will meet to resolve discrepancies in the Contract Price build-up and drive to agreement on a final Contract Price within a timeframe that will allow Work to proceed in accordance with the Contract Time and without additional cost to PG&E. Representatives of the Parties (which may include one or more representatives of PG&E and its consultants, as determined by PG&E) shall meet at the offices of PG&E, or another mutually agreed upon location, for the purpose of reviewing and discussing the components of the Contract Price build-up and reconciling all differences. If bottom-up estimates or quotations have been utilized to support the build-up of the Contract Price, any discrepancies in the estimates or quotations will be resolved as follows: First, detailed take-off quantities will be compared for discrepancies. Any discrepancies in quantities will then be resolved by the Parties. Second, the Parties will agree on productivity units to apply to the Work. Finally, all multipliers, agreed rates, and Fee will be reviewed. If agreement is reached, PG&E will notify the Contractor of its decision to proceed with the Work on the basis of the agreed Contract Price and issue a CWA. If agreement on a Contract Price cannot be reached within a time frame that allows the Contract Time to be maintained without cost impact to PG&E, PG&E at its sole discretion may execute the Work via other means, including self-performance, bidding the Work competitively, or assigning it to another contractor.

## 7. INVOICING

**7.1** All invoicing will be in accordance with the payment provisions set forth in Article 8 of the General Conditions (Attachment 1, MSA). Contractor will provide invoices and invoice support information in a native file format, i.e., Microsoft® Excel, which allows PG&E to conduct cost review and analysis. Contractor must also provide PG&E with the following invoice fields, including but not limited to:

- 7.1.1 Invoice purpose
- 7.1.2 Invoice number
- 7.1.3 Invoice date
- 7.1.4 Customer sold to
- 7.1.5 Purchase/Contract Work Authorization order number



- 7.1.6 Invoice date
- 7.1.7 Payment terms
- 7.1.8 Remit to address
- 7.1.9 Unit of measure – Only for T&M, Target Price, GMP
- 7.1.10 Description – Only for T&M, Target Price, GMP
- 7.1.11 Quantity – Only for T&M, Target Price, GMP
- 7.1.12 Unit price – Only for T&M, Target Price, GMP
- 7.1.13 Total price – Only for T&M, Target Price, GMP
- 7.1.14 Total original man hours – Only for T&M, Target Price, GMP
- 7.1.15 Man hours used. – Only for T&M, Target Price, GMP
- 7.1.16 Man hours remaining – Only for T&M, Target Price, GMP

## 8. SAFETY MANAGEMENT

**8.1** Safety. Contractor will comply with the safety requirements set forth in Article 5 of the General Conditions. Safety is paramount to PG&E and Contractor will strive for a safety record of zero injuries and incidents, and is committed to zero personnel injuries, zero work safety or environmental incidents and zero notices of violation. While performing Work, Contractor will ensure that public and individual safety is the primary consideration and that safety is incorporated into Contractor's means and methods. Contractor acknowledges that PG&E's Contractor Safety Program Standard Contract Requirements may not cover all possible risks. The Contractor is responsible for evaluating all aspects of the Work, including site risks, minimizing or eliminating exposure to those risks and completing the Work in a safe manner and will develop and submit a site-specific safety plan before crew mobilization. The site specific safety plan must be on site for the duration of the Capital Improvement Project and available for review by PG&E safety personnel or his/her designee. At a minimum, the plan must include the following:

8.1.1 A list of key project personnel responsible for safety and their Work and cell phone numbers.

8.1.2 Local emergency contact information including fire, police, medical, and direct line to the dispatch center, as well as locations of the nearest emergency facilities and hospitals, and emergency heliport sites with GPS information.

8.1.3 Contractor's requirements for personal protective equipment, company safety guidelines, and vehicle safety procedures.

8.1.4 A description of meeting formats for Contractor's project safety meetings with examples of designated topics for the safety meetings.



8.1.5 Procedures for reporting safety incidents and a communications plan for reportable safety incidents.

8.1.6 Descriptions of the identified site-specific safety concerns and the processes for minimizing associated risks.

8.1.7 The local emergency technical rescue response resources, including trench and confined space rescue.

8.1.8 The location of the nearest hospital emergency room.

8.1.9 The identity of the onsite incident commander, should an incident occur during construction.

8.1.10 The location of the nearest first aid kit and automatic external defibrillator (AED), if available, at the Work location.

8.1.11 Evacuation routes by foot and by car.

8.1.12 Secondary meeting points and areas of refuge in the event of an emergency.

8.1.13 Location hazards, such as slopes, rivers, high traffic volume, overhead lines, subterranean hazards, and open trench vaults. NOTE – Contractor shall ensure that two-way communication is verified between the Incident Commander and the local emergency response resources to ensure that all parties are notified of emergency response procedures.

**8.2 Safety Director.** Contractor will designate a safety director for all matters concerning Contractor's work and safety programs. The director of safety will be responsible for conducting regular site safety meetings for all Project Team Members and will conduct jobsite inspection to verify that the construction work is being performed in a safe and workmanlike manner and in compliance with the safety program. The safety director will provide written notice to any party in violation of the safety program demanding immediate correction of any known safety violation. The safety director will also notify PG&E of any known safety violations of PG&E or any of its separate contractors or consultants.

**8.3 Work and Safety Program.** Contractor will ensure that all Contractor personnel receive, read and sign a copy of the PG&E's Contractor Safety Program Standard Contract Requirements, as well as Contractor's own safety requirements.

8.3.1 Work Site Safety Training. Contractor must have an ongoing safety training program for Contractor's and Subcontractors' personnel involved in the Work.

**8.4 Safety Hazards.** Contractor must identify, evaluate, and communicate to the PG&E's supervisor all safety hazards associated with each individual task. Contractor will identify and implement the means to abate or eliminate known and suspected workplace hazards. When immediate abatement or elimination of the hazard is not possible, administrative controls or personal protective measures must be taken to ensure all possible safety measures are taken to protect the public and employees.



**8.5 Clearance Procedures.** Underground/overhead utilities, confined spaces, high voltage clearances, hazardous materials, vehicular traffic around station are issues that required consideration before performing the Work. Contractor will take all necessary precautions to protect persons (employees of Contractor and PG&E, and third parties, including members of the public), and property (of Contractor, PG&E and third parties) from exposure to these risks. At a minimum, Contractor must comply with all Applicable Law that applies to the Work. Contractor must refer to Document 81 from Table 1 and IEEE STD 1246 with regards to installation of protective grounds during construction.

**8.6 Protective Equipment.** Contractor and all subcontractors will provide all necessary personal protective equipment to their respective employees for the Work being performed. At a minimum, a hard hat, safety glasses, long sleeve shirt and a class 2 or 3 traffic vest must be worn at all times while in the Work zone.

**8.7 Safety Equipment and Training.** Contractor must provide its employees, and will require all subcontractors to provide their employees, with applicable safety equipment and training. Contractor will have available, and if requested, submit to PG&E, a copy of a written respiratory protection program in accordance with Cal-OSHA GISO section 5144 and 29 CFR 1910.134. Contractor will have available and if requested, submit to PG&E, a copy of other safety and hazardous waste and hazardous material training documentation. To the extent required by the Work, Contractor will have the necessary respiratory equipment required to enter a "Category II" environment as defined in section 6.3 of API Pub 2015.

**8.8 Work Hours and Rest Period.** Contractor's employees must be in good physical and mental health when performing Work. If the nature of Work requires continuous activities for greater than twenty four (24) hours, Contractor will ensure that fresh personnel are available to continue the Work. If Work is to continue for a period exceeding 24 hours, Contractor will implement a plan for ensuring fresh personnel are available to do the Work, subject to approval by PG&E. Contractor will comply with all Applicable Laws and standard industry practices regarding work hours and rest periods for the type of Work involved.

**8.9 Project Site Visitors.** All visitors must wear appropriate personal protective equipment at all times. Contractor is solely responsible for the safety of all visitors to the Work site including suppliers, subcontractors, and third parties.

**8.10 Safety Information.** Contractor must furnish all safety notification information required by Applicable Law and the Contract Documents and ensure that all required information is posted at the Work site office and, when directed, at remote locations. Such information includes, but is not limited to, training certifications, written programs, Job-Site Hazard Analysis (JHA) and emergency evacuation plans. Upon request, these documents will be made available for review by PG&E's safety director or his/her designee. Nothing contained in PG&E's review or failure to review Contractor's safety plans and information will relieve Contractor of the responsibility to perform all Work in a safe manner and in accordance with Applicable Law.

**8.11 Safety Data Sheets.** The Contractor will maintain on-site all Safety Data Sheets ("SDS") for material or products brought to the Work site that are regulated under Title 29, Code of Federal Regulations, Part 1910, as amended, or any other Applicable Law regulating material or products. Subcontractors must provide SDS to the Contractor. The Contractor will identify and report any compound that appears on the list in the following manner: SDS must be kept



on file by the Contractor at the site, with a regularly updated list of SDS copied to PG&E. The SDS must contain all information required by Title 29 or any other Applicable Law; all hazardous compounds must be clearly labeled as to content, with appropriate warnings noted, and name and address of the manufacturer listed; and all employees using these compounds must be trained in protective handling and potential hazards.

**8.12 PG&E Monitoring.** PG&E may provide safety personnel to periodically monitor Work activities and the Work site area for site-specific safety hazards that expose the public, employees, contractors or subcontractors. Contractor will comply with safety measures recommended by PG&E's on-site safety personnel; however, in the event the recommendations interfere with Contractor's ability to complete the Work within the Contract Time, Contract Price, or Contractor's safety precautions or programs, Contractor will immediately advise PG&E. PG&E monitoring safety at the Work site will not relieve Contractor of its responsibility to perform all Work in a safe manner and in accordance with Applicable Law.

**8.13 PG&E's Rights.** PG&E will have the right, from time to time, to undertake a safety performance audit of Contractor's Work, work practices, tools, equipment and materials. PG&E may, at any time and in its sole discretion, suspend all or a portion of the Work for safety-related reasons. Contractor will take immediate, appropriate corrective action.

**8.14 Contractor Solely Responsible.** Although PG&E may monitor Contractor's safety performance, may review safety performance with Contractor's safety director, or may suspend the Work for safety-related reasons, the Contractor will remain solely responsible for the safe performance of the Work in accordance with the Contract Documents and Applicable Law.

**8.15 No Endorsement.** PG&E's receipt of Contractor's emergency action plan, safety plan, environmental plan or any other safety and health related information does not imply that PG&E endorses the plan. Contractor is solely responsible for performing the Work in compliance with the Contract Documents and Applicable Law.

**8.16 Emergencies and Accidents.** In an emergency affecting safety of persons or property, the Contractor or any subcontractor may act, at their discretion, to prevent or mitigate threatened damage, injury or loss. The safety director must promptly notify and report all accidents to the proper authorities as appropriate regarding accidents arising from the Work that result in death, personal injury or fire, as well as to the onsite incident commander and PG&E, giving full details and statements of any witnesses.

8.16.1 Contractor will provide site-specific safety updates on a daily basis. Safety updates shall include a list of incidents and near-misses with detailed information on background, date of occurrence, actions taken, and mitigation plans such as training and tailboards.

8.16.2 Contractor will communicate near-miss events within 48 hours of occurrence to PG&E.

8.16.3 Contractor must report all job site incidents involving employees, subcontractors, third-parties, equipment or visitors related activities to PG&E as soon as practical, no later than the close of business day of the event. Contractor must report serious incidents, as defined by Cal/OSHA – Title 8, Section 330(h), to PG&E immediately but no later than 2 hours of occurrence.



**8.17 Specific Work Requirements.** Contractor will excavate backfill, compact and shore in accordance with the trenching and shoring requirements set forth in Section 21.8 of the General Conditions. In the event Contractor encounters groundwater in excavations, Contractor will furnish, install, operate and maintain dewatering systems. The systems furnished by Contractor must be adequate to eliminate standing water within the construction area and adjacent areas and allow construction activities to be performed in a dry environment. Contractor will treat and dispose of water from dewatering operations in accordance with all Applicable Law and applicable permits.

**8.18 Flame Retardant Clothing.**

8.18.1 Contractor will ensure that all Contractors' and subcontractors' personnel performing portions of the Work as described below wear flame retardant clothing as defined by the American Society for Testing and Materials standard TM F1506-02a, "Standard Performance Specification for Textile Materials for Wearing Apparel for Use by Electrical Workers Exposed to Momentary Electric Arc and Related Thermal Hazards" under any of the following conditions:

(a) The Contractor's personnel are subject to contact with energized circuit parts operation at more than 600 volts.

(b) The Contractor's personnel's clothing could be ignited by flammable material in the work area that could be ignited by an electric arc.

(c) The Contractor's personnel's clothing could be ignited by molten metal or electric arcs from faulted conductors in the work area.

8.18.2 Contractor must ensure that Contractor's personnel wear flame retardant clothing that has an arc rating greater than or equal to the available heat energy and ensure that personnel wear clothing that could not melt or ignite and continue to burn in the National Electric Safety Code (NESC-IEEE C2-2007). All garments must have tags visible from the outside that clearly identifies the garment as Flame Resistant (FR) and clearly indicates the arc rating (HRC category) of the garment. All garments shall have a minimum rating of HRC 2.

(a) All Contractor's personnel requiring access to PG&E substation facilities of PG&E power generation facilities will be required, at a minimum, to wear flame retardant clothing (long sleeve shirts, long pants or coverall as required) rated HRC 2 with a minimum rating of 8 cal/cm<sup>2</sup> for personal protection as required by the PG&E Arc Flash Hazard Control Procedure (SHC 237).

**9. ENVIRONMENTAL AND SUSTAINABILITY MANAGEMENT**

**9.1 Environmental Management.** Contractor will meet PG&E's Supplier Environmental Management Standards set forth in Attachment 10 to the MSA. Performance to these standards will be tracked through the Electric Utility Industry Sustainable Supply Chain Alliance (EUISSCA) Sustainability Survey and will be evaluated through regular Scorecard reviews.

**9.2 Environmental Laws.** Contractor will comply with all Applicable Law governing environmental and endangered species and must conduct its operations in a manner consistent



with applicable special permits. To the extent the Work is subject to PG&E's specific environmental permits or programs, PG&E will provide Contractor with such permit or program requirements.

## **10. CONTINUOUS IMPROVEMENT**

**10.1** As part of the continuous improvement practice as described in Section 15.14 of the General Conditions, Contractor will submit to PG&E for written approval a statement with supporting documentation of all best practices based on Work performed, including but not limited to the following:

10.1.1 All savings realized on a Capital Improvement Project with an analysis of how and why savings occurred.

10.1.2 All unanticipated costs incurred with suggested means to better anticipate those costs in the future.

10.1.3 An analysis of all safety and environmental incidents, including near misses, with a plan for avoiding those incidents in future projects.

10.1.4 If there were no safety or environmental incidents or near misses during construction, an explanation of what worked well from the safety perspective

10.1.5 An analysis of the labor and equipment productivity levels achieved during the Capital Improvement Project, including an explanation of crew compositions and equipment utilization, with suggestions on how these productivity levels could be improved on future projects

10.1.6 An analysis of all Schedule adjustments made as a result of delay impacts and suggestions on how to avoid the need for Schedule adjustments due to delays on future projects.

10.1.7 Measures taken to improve relations with permitting agencies, neighbors, and PG&E customers.

10.1.8 An analysis of any quality issues, how they were resolved, and how to avoid those issues in the future.

10.1.9 Any other process improvement items.

## **11. MATERIAL FURNISHED BY PG&E**

**11.1** Receipt of Material. Contractor will take receipt of PG&E furnished material at Contractor's specified material staging area. Contractor will inventory and check all material items upon their delivery. Contractor will be required to provide written verification that it has received the material after inventory and inspection. Discrepancies in material not reported at the time of inventory and receipt will not be a basis for extension of Contract Time or an increase in Contract Price. Contractor is also responsible for the replacement of any material lost, stolen or damaged after receipt.



**11.2 Back Orders.** Contractor may be required to pick up any back ordered material at PG&E's warehouse or service center.

**11.3 Material Handling.** Contractor will load, unload, store, transport and otherwise care for materials in the most suitable manner to protect the items from loss or damage due to weather, theft, mishandling or improper care. Entire responsibility for the proper storage and protection of materials rests with the Contractor. Contractor will obtain all permits required by the Governmental Authority for transportation of the materials for any movement after their receipt.

**11.4 Surplus Material.** Contractor will return to PG&E all excess materials furnished by PG&E. Contractor will be charged for any materials not used and not returned. At its option, PG&E may pick up the surplus material at Contractor's material staging area or may require Contractor to deliver the surplus material to PG&E's nearest materials facility. If PG&E wants to pick up the surplus material, Contractor will provide PG&E with access to the material staging area.

**11.4.1 Salvage Material.** Unused, excess materials or "salvage materials" that have value will become PG&E's property per Section 6.4.3 of the General Conditions. Care must be taken by Contractor during the removal of existing facilities to ensure that no salvage material that has value is damaged during the Work. Some salvage material may be deemed to have "no value." PG&E will make all value/no value decisions. Contractor will provide an itemized list of the salvage material to PG&E. This list must include the Project name, Contract number and reference Project location and, at a minimum, list all poles, anchors, pole line guys, cross arms, conductors, equipment, insulators and clamps returned to PG&E, as well as any salvage material disposed of as having "no value." Any salvage material classified by PG&E as having "no value" may become the property of the Contractor. The "no value" material will be disposed of properly and at Contractor's expense. All salvage materials of value must be properly package, bundle or grouped for ease of loading, unloading and handling unless otherwise authorized by PG&E, in writing.

**11.4.2 Waste Material.** Contractor is responsible for the disposal of waste materials and the associated costs. Under no circumstances will Contractor discard any waste material, whether classified as a hazardous waste or not, into PG&E's dumpsters or waste containers. Such hazardous waste items include, but are not limited to, batteries, aerosol cans, paint, oil containers, oil-soaked rags, high-pressure sodium vapor or mercury vapor lamps, liquid fuses and methylisothiocyanate cartridges.

## **12. PERSONNEL REQUIREMENTS**

**12.1 Employee Data.** If requested, the Contractor will furnish PG&E the following information on each employee before commencing Work: full name, address, date of birth, employee number or social security number and PG&E work location. Contractor will advise PG&E of temporary or permanent changes in personnel and update the required information accordingly.

**12.2 Employee Identification.** If required by PG&E, Contractor's and subcontractors' personnel will wear a photo identification badge with photo and name clearly visible while at the Work site. Badges are to be furnished by and at Contractor's expense.



**12.3 Documentation of Individuals and Qualifications.** The documentation that supports an individual's qualification must, as a minimum, include: (i) the identity of the individual including, but not necessarily limited to, full name and the last four digits of the Social Security Number or, preferably, the employee number; (ii) identification of each task/subtask for which he/she is qualified; (iii) date of qualification for each task/subtask; (iv) qualification frequency as determined by PG&E; (v) last qualification date; and (vi) qualification method – oral, written, and/or performance-based. All Contractor and subcontractor qualifications will expire upon Final Completion of a Capital Improvement Project or as determined, in writing, by PG&E.

**12.4 Record Keeping.** As defined in Section 1.8 of PG&E's Operator Qualification – Basic Plan, Contractor and subcontractor(s) must maintain records of individual qualification while the individual is performing covered tasks/subtasks and for a minimum period of 5 years after the individual is no longer performing covered tasks/subtasks.

**12.5 Sign-in.** If required by PG&E, upon entering or leaving PG&E's Work site, Contractor, its employees and subcontractors will sign a log provided by PG&E.

### **13. ADDITIONAL REPORTING**

**13.1 Target Price, T&M, and GMP Compensation Models.** Contractor will submit a monthly record of man-hours worked by each of its employees to facilitate PG&E's accounting by means of an LM&E sheet. Contractor may use their own form providing it contains the same information as PG&E's LM&E and is approved by PG&E. The transcript must fully describe the various classes of Work performed in conformance with the applicable classifications set forth in PG&E's item segregation, or the breakdown of the classifications as may be deemed advisable by PG&E. The transcript will also indicate the time allotted to each classification of Work and the hourly or daily applicable rates of pay of the employees.

**13.2 For Target Price, T&M and GMP,** a headcount report and forecast of the number of full time people, for both Contractor and subcontractors, performing portions of the Work for the periods before the previous month, the previous month, and for future months until the completion of the Work.

### **14. CUSTOMER AND COMMUNITY SATISFACTION**

**14.1 Pre-Construction Contact.** Contractor will contact all property owners per Section 18.2 of the General Conditions before entry on the property or commencement of the Work. The notice will describe the construction activity and Contractor will use best efforts to accommodate property owners' reasonable concerns and requests.

**14.2 Resolution of Complaint.** Contractor understands that PG&E places high importance on maintaining customer and community satisfaction. Due to the ongoing business relationships between PG&E and its customers, and PG&E's presence in the community, it is extremely important for Contractor to perform its Work in a timely, conscientious, safe, and businesslike fashion with a minimum of delays and disputes. Contractor further understands that customer and community complaints arising from Contractor's activities will probably be directed at PG&E. Accordingly, Contractor agrees to resolve all non-frivolous complaints (as determined by PG&E) from a PG&E customer within 5 working days after notification by the customer, community resident, or the PG&E Inspector, whichever is earlier.



**14.3 PG&E Image.** Even if Contractor resolves any complaint in a timely manner, PG&E's credibility with its customers could suffer harm due to an excessive number of property damage claims. Therefore, Contractor must keep the number of complaints to a minimum.

## **15. EXPLOSIVES**

**15.1** Explosives are Prohibited. Use of explosives during performance of the Work is prohibited unless specifically authorized, in writing, by PG&E before such Work commences. If explosives are required in performance of the Work, Contractor will acquire any required permits and must submit to PG&E a detailed description of the location and nature of the obstruction requiring explosives. If PG&E agrees with Contractor's assessment, PG&E will provide Contractor, in writing, specific limitations and Specifications for when explosives may be used. Contractor may not proceed under any circumstances with the use of explosives until Contractor has received Specifications, in writing, from PG&E. PG&E providing, or failing to provide, Specifications does not relieve Contractor of the responsibility to use the explosives safely and in accordance with Applicable Law.

**15.2 Accountability.** If Contractor must use explosives in the performance of Work, Contractor will establish the means by which the inventory of such explosives is carefully controlled. Contractor will document each item brought on site including, but not limited to, caps, powder and primer cord. At the conclusion of the Work requiring use of the explosives, Contractor will inventory and account for each and every explosive item brought onto the site compared to the inventory of explosive items used or remaining in Contractor's inventory. All unused explosive items must be removed from the Work site immediately after the Work requiring use of the explosives is completed. Absolutely no dangerous materials may be left at the Work site. Contractor will be responsible for all costs, penalties, and fines associated with any incident resulting from Contractor's loss or misuse of any explosive item.

## **16. PERFORMANCE MANAGEMENT**

**16.1 General.** Key Performance Indicators ("KPIs") will be used to track the performance of the Work. Performance of Work will be measured by a performance scorecard set forth below. Each KPI will be rated on a scale of 1 to 5. Each rating number will signify a certain level of performance with a rating of 1 signifying "below expectations", a rating of 3 signifying "meets expectations", and a rating of 5 signifying "exceed expectations". Metrics for each KPI will be mutually developed and agreed to by PG&E and the Contractor acting through the appropriate representatives. Performance scorecard ratings will have a direct impact on Contractor's future project award opportunities.

<b>Contractor Key Performance Indicators</b>	<b>Metric</b>	<b>Scale (1-5)</b>	<b>Score</b>
Capital Improvement Project delivered within the Contract Time	Substantial Completion Date		
Capital Improvement Projects delivered at or below the Contract Price	Contract Price		
Percentage of Increase for Change Orders			



Total Number of Cost Related RFIs			
Percentage of Submittals approved on first round			
No. of environmental non-compliances notices issued			
No. of safety issues/incidents reported			
Diversity participation dollars and percentage			
Timely notice of claims and dispute resolution			

PG&E Key Performance Indicators	Metric	Scale (1-5)	Score
PG&E's timely approval of Contractor's progress payments			
PG&E's timely release of Contractor retention			
PG&E's timely execution of valid Change Orders			
PG&E's timely response to RFIs			
PG&E's timely submittal review			
PG&E's timely resolution of disputes			

## 17. VOLUME REBATE/DISCOUNT PROVISIONS.

**17.1** Contractor Rebate/Discount. PG&E is entitled to a volume rebate or equivalent discount from Contractor. PG&E will provide Contractor with a list of PG&E preferred vendors who offer volume discounts. In addition, Contractor will provide PG&E with a volume discount percentage based on the amount of Work performed or expected to be performed under the MSA. The Volume Rebate/Discount will be included in Attachment 3B to the MSA.

**17.2** Invoice Validation Process. The following must be completed before invoices are submitted to PG&E in accordance with Article 8 of the General Conditions (Attachment 1, MSA)

17.2.1 PO/CWA fully signed (existing)

17.2.2 Order numbers/PCCs/Other financial accounting codes (existing)

17.2.3 Prices and quantities verified (as applicable)

17.2.4 Determination of Authority (DOA)



17.2.5 Any other requirement agreed upon at each CWA (as applicable).

**17.3** **Tracking.** Contractor will track and provide running totals of spend during the billing period, which PG&E will also track in SAP. Contractor will notify PG&E in writing when each threshold is reached. The applicable discount will be applied to all invoices based on the threshold as specified. Contractor is responsible for tracking the billing level, notifying PG&E in writing, and applying the corresponding volume discount to invoicing. Any discounts that are missed or withheld for any reason will be trued up and credited to corresponding CWAs or reimbursed in full. PG&E reserves the right to perform third party audit up to 3 years after the end of the annual billing period to claim any withheld discounts in the previous billing period.

## 18. MISCELLANEOUS

**18.1** **Emergency Work.** In the event of an emergency or, other circumstance in which Contractor agrees to start performance of such Work upon notice and PG&E will compensate Contractor for costs incurred, on a time and material basis and in accordance with Section 19.3 of the General Conditions (MSA, Attachment 1).

**18.3** **Flexible Regional Portfolios.** PG&E will assign Electric Work to Contractor in one of two PG&E regions (north and south) and in other work distribution approaches that align with other PG&E business units. Contractor acknowledges that the borders between regions will be flexed to redistribute the Work more evenly and provide for as much continuity as possible in the two regions. Contractor further acknowledges that certain Work within one region may be assigned to another contractor for any reason, including taking advantage of the specific skillset and/or productivity of the other contractor.

“Attachment 3 Redacted”



## **Contractor Safety Program Standard Contract Requirements**

### **1. Summary**

PG&E is committed to improving employee, contractor and public safety. PG&E's Contractor Safety Program establishes the minimum safety requirements for all PG&E Contractors and Subcontractors performing High Risk Work or Medium Risk Work on PG&E assets. All Contractors and Subcontractors performing High Risk Work or Medium Risk Work on PG&E assets are obligated to comply with the requirements of PG&E's Contractor Safety Program.

### **2. Definitions**

Capitalized terms will have the meaning set forth in PG&E's Contract with Contractor and as defined herein.

**"DART"** (Days Away, Restricted or Transferred duty) – means the rate of injuries/illnesses resulting in lost-work, restricted work or a transfer of job duties as a result of the injury or illness.

**"Designated Work Area"** – means an area where it is necessary to restrict or limit entry or access of nonessential personnel or the public. Examples include work areas involving remediation, abatement, demolition, excavation, and overhead lifting.

**"Experience Modification Rate"** or **"EMR"** – Ratio of a company's frequency and severity of injuries vs. an average estimated amount of loss for that industry, based on Workers' Compensation information

**"High Risk Work"** means Work that directly exposes Contractor or Subcontractor personnel to PG&E systems, assets or processes associated with power generation, gas or electric transmission or distribution operations, or requires bodily entry into a confined space or other hazardous environment, applying lockout/tagout devices as part of hazardous energy control, working at a height requiring the use of fall arresting or restraining equipment, entering an excavation greater than four feet, demolition activities, use of explosive devices, commercial diving, aviation services, vegetative management beyond weed control, handling or transporting hazardous chemicals. Examples of High Risk Work include heavy earthmoving equipment operations, complex system construction, rebuild or repair, scaffold erection or dismantling, hazardous materials abatement, cleanup, disposal, testing or transportation, demolition or explosive work, commercial diving operations or work on, over or near water, aviation services, and vegetative management.

**"Low Risk Work"** means Work at or on PG&E Assets that does not involve exposure to (a) any hazards associated with power generation, gas or electric transmission or distribution processes or process-related equipment or (b) Designated Work Areas. Low Risk Work requires minimal advance planning, preparation, formal training, or work controls. Examples of Low Risk Work include office area workers, classroom instructors, technical or consulting services, inspection or testing, grass cutting/trimming/pruning, minor alterations/repairs to low voltage electrical or water supply/drainage systems, short term engineering not involving plant access, and siting/Surveying outside a designated work zone.

**"Medium Risk Work"** means Work at or on PG&E Assets that requires advanced planning, preparation, formal training, work controls, oversight, or specialized Personal Protective Equipment beyond hardhat, safety glasses, safety-toed footwear or high visibility vests. Examples of Medium Risk Work include landscaping requiring the use of earthmoving equipment, digging, excavating or

## **Contractor Safety Program Standard Contract Requirements**

trenching less than four feet, non-complex electrical installation or repair, non-hazardous spill cleanup, pesticide or herbicide spraying requiring an applicators license, and traffic control.

“PG&E Assets” means real property or tangible personal property owned or operated by PG&E.

“Third-Party Administrator” or “TPA” – means the online database resource utilized by PG&E to collect safety, procurement, sustainability, quality and regulatory information from Contractors and verify its accuracy.

### **3. Contractor and Subcontractor Pre-qualification Requirements**

3.1 Subject to Section 3.2 below, Contractor and all Subcontractors of any tier will meet the pre-qualification requirements identified in Table 1: Safety Pre-Qualification Criteria below if performing any Medium Risk Work or High Risk Work on PG&E Assets.

3.2 If Contractor any Subcontractor does not meet the pre-qualification requirements identified in Table 1: Safety Pre-Qualification Criteria, at its sole discretion, PG&E may authorize Contractor or Contractor’s proposed Subcontractor to perform Medium Risk Work or High Risk Work and will have the right to impose additional conditions for the Work. Contractor will comply, and cause all affected Subcontractors to comply, with all additional conditions PG&E imposes on the Work at no cost to PG&E.

3.3 Contractor will provide PG&E and its third party administrator with such information as PG&E deems necessary in its sole discretion to determine whether Contractor and its Subcontractors meet the pre-qualification requirements, including but not limited to year-to-date safety and injury data and data regarding serious safety incidents affecting the public. All information will be provided in the manner and format requested by PG&E in its sole discretion.

3.4 Safety data of the entity proposed to actually perform Work on PG&E Assets must be provided. Safety data of parent entities or any affiliates will not be accepted.

3.5 All costs associated with compliance with PG&E’s pre-qualification requirements will be at Contractor’s sole cost and expense, including but not limited to all fees charged by PG&E’s third party administrator and costs associated with additional conditions PG&E imposes on the Work under Section 3.2.

3.6 Contractor will not commence any Work for which prequalification is required under this Section 3 prior to obtaining written approval from PG&E that Contractor has satisfied PG&E’s pre-qualification requirements. Thereafter, Contractor will provide PG&E updates annually of all data supplied as part of the pre-qualification process. PG&E reserves the right to terminate the Contract for cause if PG&E determines in its sole discretion that Contractor no longer meets the prequalification requirements. PG&E reserves the right to require Contractor to replace any Subcontractor at Contractor’s sole cost and expense if PG&E determines in its sole discretion that the Subcontractor no longer meets the prequalification requirements.

3.7 Contractor will not allow any Subcontractor to commence any Work for which prequalification is required under this Section 3 prior to obtaining written approval from PG&E that the Subcontractor has satisfied PG&E’s pre-qualification requirements.



## **Contractor Safety Program Standard Contract Requirements**

3.8 Contractor represents and warrants that all information Contractor and its Subcontractors supply in compliance with PG&E's Contractor Safety Program is true and accurate.

### **4. Safety Requirements for the Work**

4.1 Contractor recognizes and agrees that safety is of paramount importance in performing any Work for PG&E regardless of whether the Work is Low Risk Work, Medium Risk Work, or High Risk Work. Contractor will perform all Work safely, in compliance with PG&E's Contractor Safety Program, Contractor's safety program, and any additional safety standards, procedures, rules, or requirements set forth in PG&E's contract with Contractor.

4.2 Contractor will perform all Work in a manner that complies with all applicable federal, state, and local laws, rules, and regulations and complies with safety best practices.

4.3 Contractor will perform all Work in a manner that safeguards persons and property from injury and will train all Contractor and Subcontractor personnel on all PG&E's Contractor Safety Program, Contractor's safety program, all job related hazards, and all safety laws, rules, regulations, or requirements applicable to the Work.

4.4 Contractor will inspect all materials, tools, equipment, and facilities for safety prior to use.

4.5 Contractor will require all Contractor and Subcontractor personnel performing Work on PG&E assets to be fit for duty and comply with the drug and alcohol programs of both PG&E and, if applicable, the Department of Transportation.

4.6 Contractor will cooperate with PG&E to determine applicable PG&E and regulatory requirements and appropriate control measures to eliminate or mitigate hazards specific to the Work.

4.7 Contractor will use the appropriate job hazard analysis methods for identifying and communicating known or potential hazards to its personnel and other potentially impacted workforces prior to commencing work.

4.8 Contractor will maintain effective oversight of work crews to ensure compliance with PG&E and regulatory safety requirements for its personnel and other workforces under its direct control.

4.9 If performing High Risk Work, Contractor will supply PG&E with a project-specific safety plan for the Work that includes all safety-specific activities and the training, qualifications, and staffing plan for safety professions that Contractor will have overseeing the Work.

4.10 Contractor will stop work as necessary to ensure compliance with safe work practices and applicable federal, state and local laws, rules and regulations.

4.11 Prior to implementing any significant changes to the Work, re-perform the requirements set forth in Sections 4.3 through 4.8 and if applicable 4.9 to ensure compliance with this standard and implement any needed additional measures or modifications to existing measures.

## **Contractor Safety Program Standard Contract Requirements**

4.12 The requirements are in addition to any other requirements or obligations set forth in the Contract documents or applicable federal, state, and local laws, rules, regulations, and permits.

### **5. PG&E Rights with respect to Safety**

5.1 Contractor agrees that, in addition to any other right under the Contract or at law or in equity, PG&E will have the right to

(a) review and approve all Contractor and Subcontractor work plans and work specific safety requirements;

(b) designate safety precautions in addition to those in use or proposed by Contractor;

(c) verify Contractor and Subcontractors have effectively planned for eliminating or controlling work hazards that may impact the safety or health of PG&E and Contractor personnel or the general public.

(d) require Contractor to provide additional safeguards beyond what Contractor plans to utilize;

(e) conduct and document field safety observations and inspections to verify Contractor compliance with the Contractor Safety Program, the Contract requirements, applicable federal, state, and local laws, rules, regulations, and permits.

(d) stop work to ensure compliance with safe work practices and applicable federal, state and local laws, rules, and regulations;

(e) suspend, terminate, or place on probationary status Contractor in the event of a safety incident or failure to comply with these program requirements; and

(f) evaluate Contractor and Subcontractor safety performance periodically during performance of the Work and at conclusion of the Work.

• 5.2 The requirements set forth in this Article 5 are in addition to any other rights set forth in the Contract documents or applicable federal, state, and local laws, rules, regulations, and permits.

### **6. Safety Incident Investigations and Compliance With PG&E Causal Evaluation Standard**

6.1 Contractor will immediately inform PG&E of all safety incidents that occur during the performance of Work on PG&E Assets by Contractor or any Subcontractor.

6.2 Contractor will promptly, thoroughly, and transparently investigate all safety incidents that occur during Contractor's or any Subcontractor's performance of Work on PG&E Assets in compliance with PG&E's Enterprise Causal Evaluation Standard.

## **Contractor Safety Program Standard Contract Requirements**

6.3 Contractor will cooperate and provide reasonable assistance, and cause each of its Subcontractors to cooperate and provide reasonable assistance, to PG&E with any (a) incident analysis or investigations PG&E conducts following a safety incident and (b) regulatory or agency investigations and inquiries that arise as a result of the safety incident.

6.4 Contractor will supply PG&E with complete copies of all documents, photographs, witness statements, and other evidence related to the incident and all investigation materials promptly upon PG&E's request.

### **Attachment**

### **Table #1: Pre-Qualification Criteria**

**Table #1: Pre-Qualification Criteria**

Targets Based on 3-year averages	Acceptable (Green)	Not Acceptable (Red)
<b>Except fatalities</b>		
Number of Fatalities within the last 5-years (Vehicular fatalities excluded)	No fatalities within 5-years	Fatalities within a 5-years
Experience Modification Rate (EMR)	Equal or less than 1.10	Greater than 1.10
Confirmed OSHA Citations	3 or less serious citations within the most recent 3-years with no willful or repeat citations	More than 3 serious citations within the most recent 3-years or any willful or repeat citations
Total Recordable Incident Rate	Equal or better than 3-year industry average	Worse than 3-year industry average
DART Rate	Equal or better than 3-year industry average	Worse than 3-year industry average
Additionally, contractors are required to submit for review their Company safety plan/program, drug/alcohol program, disciplinary program for review and serious safety incidents affecting the public for the last 5 years.		

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## **Insurance Requirements**

### **1. INSURANCE REQUIREMENTS**

Contractor will, at its sole cost and expense, procure and maintain the following insurance coverage and be responsible for its Subcontractors maintaining sufficient limits of the appropriate insurance coverage.

**1.1 WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY:** Workers' Compensation insurance or self-insurance indicating compliance with applicable labor codes, acts, laws or statutes, state or federal, where Contractor performs Work.

1.1.1 Employers' Liability insurance will be \$1,000,000 for injury or death each accident.

**1.2 COMMERCIAL GENERAL LIABILITY (CGL):** Coverage will be as broad as the current Insurance Services Office (ISO) Commercial General Liability Coverage "occurrence" form, with no alterations to the coverage form.

1.2.1 Unless otherwise modified through mutual agreement of the Parties in the CWA, the limit will be \$50,000,000 each occurrence and in the aggregate for bodily injury, property damage, personal injury and completed operations. Defense costs will be provided as an additional benefit and not included within the limits of liability. Coverage limits may be satisfied using an umbrella or excess liability policy or an Owners and Contractors Protective Liability (OCP) policy.

1.2.2 Coverage will: a) by "Additional Insured" endorsement add as insureds PG&E, PG&E's directors, officers, employees, agents, and its parent company, affiliates, and subsidiaries, with respect to liability arising out of the Work performed by or for the Contractor. (ISO Form CG 20 10 04 13 or equivalent) In the event the CGL policy includes a "blanket additional insured by contract" endorsement, the following language added to the certificate of insurance will satisfy the requirement: "PG&E, PG&E's directors, officers, employees, agents, and its parent company, affiliates, and subsidiaries, with respect to liability arising out of the Work performed by or for the Contractor, has been endorsed by blanket endorsement;" b) be endorsed to specify that the Contractor's insurance is primary and that any insurance or self-insurance maintained by PG&E will not contribute with it and; c) include a severability of interest clause.

**1.3 BUSINESS AUTO:** Coverage will be as broad as the Insurance Services Office (ISO) Business Auto Coverage form covering Automobile Liability, code 1 "any auto."

1.3.1 The limit will be \$5,000,000 combined single limit for each accident for bodily injury and property damage.

1.3.2 If scope of work includes hauling hazardous material, then limit will match the DOT requirement and will be endorsed in accordance with MCS90.

**1.4 ALL RISKS BUILDERS RISK PROPERTY INSURANCE:** An All Risk Property insurance policy will be provided to cover all Work, property and delayed opening coverage for Attachment 5  
Insurance Requirements

## **Insurance Requirements**

the Project and during construction, testing, start-up for any and all materials, equipment and machinery intended for the project while at the site, off-site and during transit to the site.

Coverage to include and will not be limited to fire, earthquake, flood, extended coverage, expediting expense and extra expense, and collapse will be maintained during the course of work being performed.

1.4.1 Coverage will be written on a replacement cost basis for the full completed value of the Project. Limits and deductibles will be approved by PG&E. Such policy will remain in full force and effect until possession and control of the Project is transferred to PG&E.

1.4.2 PG&E will be named as Loss Payee as their interest may appear (ITIMA).

**1.5 POLLUTION LEGAL LIABILITY/CONTRACTORS POLLUTION LIABILITY:** For scope of Work involving environmental exposures, Contractor will maintain pollution liability insurance with coverage for bodily injury and property damage, including cleanup costs and defense costs resulting from sudden and gradual pollution conditions including the discharge, dispersal, release or escape of smoke, vapors, soot, fumes, acids, alkalis, toxic chemicals, hydrocarbons, liquids or gases, waste materials or other irritants, contaminants or pollutants into or upon land, the atmosphere or any watercourse or body of water. If Work involves asbestos or lead abatement or exposure, Contractor's pollution policy will not include asbestos or lead liability exclusions.

1.5.1 The limit will be \$10,000,000.00 each occurrence and in the aggregate for bodily injury and property damage.

1.5.2 The policy will endorse PG&E as additional insured.

**1.6 PROFESSIONAL LIABILITY INSURANCE:** Contractor will maintain Professional Liability insurance appropriate for the profession and services to be performed. Insurance will cover the professional errors, acts or omissions arising out of the professional services rendered by or for the Contractor.

1.6.1 The limit of insurance will be \$15,000,000 each claim and in the aggregate.

**1.7 AIRCRAFT LIABILITY:** If aircraft is used in the Work, coverage will be classified for the intended aircraft scope of work and include coverage for bodily injury, property damage including injury sustained by any passenger, applying to all aircraft owned, furnished or used by the Contractor in the performance of this Contract.

1.7.1 The limit will be \$5,000,000 each occurrence and in the aggregate for bodily injury and property damage including passenger liability.

1.7.2 Coverage will: a) Be endorsed to specify that the Contractor's insurance is primary and that any insurance or self-insurance maintained by PG&E will not contribute with it; b) include a severability of interest clause.

## **Insurance Requirements**

**1.8 HULL INSURANCE:** Coverage for physical damage for the full value of the aircraft and coverage will waive all rights of subrogation against PG&E with respect to all physical damage to any aircraft used during the performance of this Contract.

**1.9 OCEAN/INLAND MARINE CARGO INSURANCE:** An Ocean/Inland Marine Cargo policy will be provided for site to site coverage, and loss or damage to freight while in the care, custody or control of Contractor. Contractor will be responsible for each shipment and safe handling, transport and unloading of the shipment at the destination in the manner and location designated.

1.9.1 Coverage will be in amounts equal to full replacement value. Coverage will be separate for each vehicle, vessel or other means of transportation of freight.

1.9.2 Carrier will by endorsement name PG&E as a loss payee.

**1.10 CRIME LIABILITY INSURANCE:**

1.10.1 Coverage will include but not be limited to Employee Dishonesty, with limits of \$1,000,000 per occurrence and in the aggregate.

1.10.2 Coverage will provide for losses caused by the actual destruction, disappearance, wrongful abstraction or theft by the Contractor.

**1.11 DOCUMENTATION REQUIREMENTS**

1.11.1 Before beginning any Work, Contractor will furnish PG&E with certificates of insurance and endorsements of all required insurance.

1.11.2 The insurer will deliver notification to PG&E in accordance with the policy provisions if any of the above-described policies are cancelled before the stated expiration date.

1.11.3 PG&E uses a third party vendor to collect and confirm insurance documents. Certificates of insurance and endorsements will be signed and submitted by a person authorized by that insurer to issue certificates of insurance and endorsements on its behalf and must be submitted by e-mail or fax only:

Certificate Holder: Pacific Gas and Electric Company  
c/o EXIGIS LLC  
E-mail: support@exigis.com  
Fax: 646-755-3327

Contractor will also send a copy of all such insurance documents to PG&E's Contract negotiator and Contract administrator.

1.11.4 PG&E may inspect the redacted policies in the offices of Contractor in Houston, Texas during normal working hours. In the event of an occurrence that may give rise

## **Insurance Requirements**

to a claim against Contractor's insurance policies, Contractor will provide PG&E with copies of the relevant policies.

1.11.5 Upon request, Contractor will furnish PG&E the same evidence of insurance for its Subcontractors as PG&E requires of Contractor.

**1.12 FORM AND CONTENT:** All policies or binders with respect to insurance maintained by Contractor will conform to the following requirements:

1.12.1 Except for Professional Liability and Aircraft Liability, all policies or binders with respect to insurance maintained will waive any right of subrogation of the insurers hereunder against PG&E, PG&E's directors, officers, employees, and agents, and its parent company, affiliates, and subsidiaries.

1.12.2 With respect to any additional insured, provide that such insurance will not be invalidated by any action or inaction of each insured and will insure each such insured regardless of any breach or violation of any warranty, declaration or condition contained in such insurance by the primary named insured.

1.12.3 PG&E and Contractor may agree in the CWA for each project on (a) the requirement to include Contractor as a loss payee on any builders-all risk or other property insurance policy for a project and (b) the requirement to include Contractor as an additional insured on the general liability insurance policies of other project contractors under contract with PG&E working on the same project as Contractor.



## **Supplier Diversity Statement**

### **1. General**

PG&E encourages companies interested in providing services to PG&E to support supplier diversity purchasing through its purchasing and subcontracting practices.

In order for Pacific Gas and Electric Company to include the Woman, Minority and Disabled Veteran Business Enterprise (WMDVBE) contractor or subcontractor in the Company's supplier diversity goals, the WMDVBE prime contractor or subcontractor must have a current verification by California Public Utilities Commission's WMDVBE Clearinghouse (for woman- or minority-owned businesses) or Department of General Services (for disabled service veteran-owned businesses).

Verification can also be obtained from one of the following CPUC Clearinghouse comparable agencies:

- 1.2.1 National Minority Supplier Development Council (NMSDC) or a regional affiliate;
- 1.2.2 Women's Business Enterprise National Council (WBENC) or a regional affiliate; or
- 1.2.3 Small Business Administration.

### **2. Supplier Diversity Sub-Contracting Plan**

Successful Participants will agree to a subcontracting plan, as part of their contract, to support PG&E's commitment to utilize diverse suppliers as outlined below. The term subcontractor referred to in this plan applies to subcontractors that provide a service, and sub suppliers that provide material, parts, assemblies or components. Bidder shall complete and include in their submitted proposal Exhibit 1A List of Diverse Subcontractors.

PG&E is subject to General Order (GO) 156 of the California Public Utilities Commission. GO 156 establishes goals for each utility to purchase a minimum of 21.5% of its goods and services from Women Minority and disabled Veteran Owned Business Enterprises (WMDVBEs or Diverse Suppliers). Furthermore, GO 156 sets the following sub-goals: 15% minority; 5% women, and 1.5% disabled veteran-owned business enterprises.

GO 156 requires each utility to establish and maintain a subcontracting program for the purpose of encouraging its prime contractors to utilize Diverse subcontractors. GO 156 does not authorize or permit a utility to utilize set-asides, preferences, or quotas in administration of its WMDVBE program.

As part of the Proposal, the Participant will include a stated goal to subcontract with Diverse Suppliers with both a total goal as well as sub-goals for each of the sub-categories, as follows:

<b>Minority Owned:</b>	<u>  %</u>
<b>Women Owned:</b>	<u>  %</u>

## **Supplier Diversity Statement**

<b>Disabled Veteran Owned:</b>	<u>      </u> %
<b>Total Goal (Sum of Above Sub-Goals):</b>	<b>40%</b>

The successful Participant will agree to make good faith efforts to assist PG&E in meeting its goals through the implementation of Contractor's subcontracting plan. Such good faith efforts will be measured through the Service Level Agreement and/or Performance Scorecard provisions of this Contract.

The successful Participant will agree to submit enrollment form and utilize PG&E's Supplier Diversity Management System (SDMS) for on-line reporting of spend with WMDVBEs for reporting periods as specified by PG&E.

**2.8** To assist you in any diversity subcontracting efforts, you may contact the PG&E contact person requesting Supplier Diversity Representative's assistance or you may conduct your own searches through the WMDVBE Clearinghouse at:

<http://www.cpuc.ca.gov/PUC/SupplierDiversity/database.htm>

## GUARANTY AGREEMENT

Quanta Energy Services, LLC, a corporation organized under the laws of Delaware (referred to herein as "Contractor") and **PACIFIC GAS AND ELECTRIC COMPANY** (referred to herein as "PG&E") are entering into a master agreement, contract No. 4400010156 (the "Master Agreement") and Contract Work Authorizations ("CWAs") thereunder and may enter into one or more future Master Agreement(s) and Contract Work Authorizations or contracts under the terms and conditions of said Master Agreement(s) or otherwise.

The Master Agreement and any and all future Master Agreement(s) and CWAs issued by PG&E under the Master Agreement or any future Master Agreement(s) or other work orders or contracts between PG&E and Contractor are hereinafter referred to as the "Contracts." Contractor is a subsidiary of Quanta Services, Inc. incorporated in Delaware and established in Houston, Texas (referred to herein as "Guarantor"). To induce PG&E to enter into the Master Agreement and future Contracts with Contractor, and for valuable consideration, the Guarantor is entering into this Guaranty Agreement (referred to herein also as the "Guaranty") and hereby agrees as follows:

(a) **Guaranty and Obligations.** The Guarantor, irrevocably and unconditionally guarantees to PG&E, its successors, endorsees and assigns, the due and punctual performance and payment in full of all obligations and amounts owed by the Contractor to PG&E under all now existing and future Contracts between PG&E and Contractor (all referred to collectively herein as "Contracts"), whether due or to become due, secured or unsecured, absolute or contingent (all referred to herein as "Obligations"). The liability of the Guarantor hereunder is a continuing guaranty of payment and performance when any Obligation is owing or when the Contractor is in default or breach under any of the Contracts, without regard to whether recovery may be or has become barred by any statute of limitations or otherwise may be unenforceable. In case of the failure of the Contractor to pay or perform the Obligations punctually, the Guarantor hereby agrees, upon written demand by PG&E, to perform the Obligations or pay or cause to be paid any such amounts punctually when and as the same shall become due and payable. The Guarantor hereby also agrees to reimburse PG&E for any reasonable attorneys' fees and all other costs and expenses incurred by PG&E in enforcing this Guaranty. Subject to the provisions of Section (d) "Termination," this Guaranty and the Guarantor's liability hereunder shall terminate on the first anniversary of the date on which Contractor last performs any work pursuant to a Master Agreement or CWA (the "Termination Date") if it does not earlier terminate by completion of performance of the guaranteed Obligations under the Agreement. The maximum aggregate liability of the Guarantor under this Guaranty, including with respect to the Obligations, shall not exceed \$150,000,000 (the "Cap").

(b) **Guaranty of Payment.** The Guarantor hereby agrees that its obligations under this Guaranty constitute a guaranty of payment when due and not of collection.

(c) **Nature of Guaranty.** The Guarantor hereby agrees that its obligations under this Guaranty shall be irrevocable and unconditional, irrespective of the validity, or enforceability of the Contracts against the Contractor (other than as a result of the unenforceability thereof against PG&E), the absence of any action or measure to enforce the Contractor's obligations under the Contracts, any waiver or consent of PG&E with respect to any provisions thereof, the entry by the Contractor and PG&E into amendments to any of the Contracts for additional services or otherwise, or any other circumstance which might otherwise constitute a legal or equitable discharge or defense of a guarantor (excluding the defense of payment). The Guarantor agrees that the obligations of the Guarantor under this Guaranty will upon the execution of any such amendment by the Contractor and PG&E extend to all such amendments without the taking of further action by the Guarantor, the Contractor, or PG&E. The Guarantor agrees that the Contractor and PG&E may, without prior written consent of the

Guarantor, mutually agree to modify the Obligations or the Contracts or any agreement between the Contractor and PG&E, without in any way impairing or affecting this Guaranty; provided that Guarantor shall never be obligated to guarantee payment or performance of any obligations other than the Obligations and so modified Obligations.

(d) **Termination.** This Guaranty may not be terminated by the Guarantor and shall remain in full force and effect until the earlier of all of the Obligations of the Contractor under or arising out of the Contracts have been fully performed or the Termination Date; provided that, termination of this Guaranty on the Termination Date, shall not limit or affect the Guarantor's obligations hereunder with respect to any Obligations that were incurred, arose, accrued or were not fully performed prior to or on the Termination Date.

(e) **Rescinded Payment; Independent Liability.** The Guarantor further agrees that this Guaranty shall continue to be effective or be reinstated, as the case may be, if at any time, payment, or any part thereof, of any Obligation or interest thereon is rescinded or must otherwise be restored or returned for any reason whatsoever, and the Guarantor shall remain liable hereunder in respect of such payments or obligations or interest thereon as if such payment had not been made. PG&E shall not be obligated to file any claim relating to the Obligations owing to it in the event that the Contractor becomes subject to a bankruptcy, reorganization or similar proceeding, and the failure of PG&E to file shall not affect the Guarantor's obligations hereunder. The Guarantor's obligations hereunder are independent of the Obligations of the Contractor. The liability of the Guarantor hereunder is independent of any security for or other guaranty of payment received by PG&E in connection with the Contracts, is not affected or impaired by (a) any voluntary or involuntary liquidation, dissolution, receivership, attachment, injunction, restraint, insolvency, bankruptcy, assignment for the benefit of creditors, reorganization, arrangement, composition or readjustment of, or other similar proceeding affecting, the Contractor or any of its assets, including but not limited to any rejection or other discharge of the Contractor's obligations imposed or asserted by any Court, trustee or custodian or any similar official or imposed by any law, statute or regulation in such event, or (b) the extension of time for the payment of any sum, in whole or in part, owing or payable to PG&E under any of the Contracts or this Guaranty or the extension of the time for the performance of any other obligation under or arising out of or on account of the Contracts or this Guaranty, or (c) any failure, omission or delay on the part of PG&E to enforce, assert or exercise any right, power or remedy conferred on PG&E in the Contracts or this Guaranty or any action on PG&E's part granting indulgence or extension in any form, or (d) the release, modification, waiver or failure to pursue or seek relief with respect to any other guaranty, pledge or security device whatsoever, or (e) any payment to PG&E by the Contractor that PG&E subsequently returns to the Contractor pursuant to court order in any bankruptcy or other debtor-relief proceeding, or (f) any amendment, modification or other alteration of any of the Contracts, or (g) any indemnity agreement the Contractor may have from any party, or (h) any insurance that may be available to cover any loss. The Guarantor waives any right to the deferral or modification of the Guarantor's obligations hereunder by virtue of any such debtor-relief proceeding involving the Contractor.

(f) **Guarantor Waivers.** The Guarantor hereby waives (i) promptness, diligence, presentment, demand of payment, protest, order and, except as set forth in paragraph (a) hereof, notice of any kind in connection with the Contracts and this Guaranty; (ii) any requirement that PG&E exhaust any right to take any action against the Contractor or any other person prior to or contemporaneously with proceeding to exercise any right against the Guarantor under this Guaranty; (iii) any right to require PG&E to (A) proceed against or exhaust any insurance or security held from the Contractor or any other party, or (B) pursue any other remedy available to PG&E provided that Guarantor's obligations under this Guaranty shall never exceed the lesser of the obligations of the Contractor under the Contracts or the Cap; (iv) any defense based on or arising out of any defense of the Contractor other than payment in full of the

amount(s) owed, including without limitation any defense based on or arising out of the disability of the Contractor, the unenforceability of the indebtedness from any cause, or the cessation from any cause of the liability of the Contractor, other than payment in full of the amount(s) owed. The Guarantor agrees that PG&E may, at its election, foreclose on any security held by PG&E, whether or not the means of foreclosure is commercially reasonable, or exercise any other right or remedy available to PG&E without affecting or impairing in any way the liability of the Guarantor under this Guaranty, except to the extent the amount(s) owed to PG&E by the Contractor have been paid. The Guarantor further agrees that until all amounts owed by the Contractor to PG&E are paid in full, even though such amounts may in total exceed the Guarantor's liability hereunder, the Guarantor shall have no right of subrogation, waives any right to enforce any remedy that PG&E has or may have against the Contractor, and waives any benefit of and any right to participation in any security from the Contractor now or later held by the Guarantor. The Guarantor assumes all responsibility for keeping itself informed of the Contractor's financial condition and all other factors affecting the risks and liability assumed by the Guarantor hereunder, and PG&E shall have no duty to advise the Guarantor of information known to it regarding such risks.

Notwithstanding any other provision in Section f) above, the Guarantor reserves the right to assert against PG&E all rights, setoffs, counterclaims, and defenses (collectively, "Defenses") of the Contractor provided however, such Defenses shall be waived to the extent that such Defenses were (i) waived by the Contractor or (ii) specifically and unsuccessfully raised by the Contractor in an arbitration or court proceeding between the Contractor and PG&E (in accordance with the dispute resolution provisions of the Contract) in which Guarantor was permitted to join. The Guarantor waives any and all defenses not asserted by the Contractor in such a proceeding.

In the event there is arbitration or court proceeding between the Contractor and PG&E, PG&E agrees that it will consent to joinder of such action or proceeding by Guarantor. The Guarantor agrees it will not seek to adjudicate any issues between PG&E and the Guarantor in such a proceeding

In the event of such an arbitral or court proceeding (as described in the preceding paragraphs) between the Contractor and PG&E, in which PG&E was/is the prevailing party Guarantor agrees to accept as binding and res judicata as between Guarantor and PG&E any arbitral award or judgment issued in such a proceeding, regardless of whether such arbitral award or judgment was based on California law and regardless of whether the Guarantor was a party in such a proceeding. And, in such a case all defenses of the Contractor shall be deemed to have been waived by the Guarantor.

**(g) No Assignment of Guaranty Obligations Without Consent.** The Guarantor may not assign or otherwise transfer its obligations under this Guaranty to any other party without the prior written consent of PG&E, the exercise of which shall be in PG&E's sole discretion.

**(h) Governing Law.** This Guaranty shall be governed by and construed in accordance with the laws of the State of New York, without reference to choice of law doctrine.

**(i) Jurisdiction.** With respect to any suit, action or proceedings (collectively "Proceedings") relating to this Guaranty Agreement, Guarantor irrevocably: (i) submits to the non-exclusive jurisdiction of the courts of the State of New York and the United States District Court located in the Borough of Manhattan in New York City; and (ii) waives any objection which it may have at any time to the laying of venue of any Proceedings brought in any such court, and any claim of inconvenient forum, and any objection to the jurisdiction of any such court.

**(j) Severability.** In the event that any provision of this Guaranty conflicts with the law or if any such provision is held to be invalid, illegal or unenforceable, such provision shall be deemed to be

restated to reflect as nearly as possible the original intention of the parties in accordance with applicable law or, if that is not possible, the provision shall be deleted, and the remainder of this Guaranty shall remain in full force and effect.

**(k) Representations and Warranties.** The Guarantor, through its undersigned officer, represents and warrants to PG&E that (i) the Contractor is a subsidiary or other affiliate of the Guarantor, (ii) the Guarantor is a duly organized and validly existing corporation or other legal entity in good standing under the laws of the jurisdiction of its incorporation or formation, (iii) the Guarantor has the corporate power and legal authority to execute, deliver and perform the terms and provisions of this Guaranty and has taken all necessary corporate and other action to authorize the execution, delivery and performance by it of this Guaranty, (iv) the Guarantor has duly executed and delivered this Guaranty, and (v) this Guaranty constitutes the legal, valid and binding obligation of the Guarantor enforceable in accordance with its terms.

**(l) No Amendment; No PG&E Waiver.** This Guaranty shall not be amended without the prior written consent of PG&E. Any amendment to this Guaranty made in violation of this provision shall be null and void. No right, power, remedy or privilege of PG&E under this Guaranty shall be deemed to have been waived by any act or conduct on the part of PG&E, or by any neglect to exercise any right, power, remedy or privilege, or by any delay in doing so, and every right, power, remedy or privilege of PG&E hereunder shall continue in full force and effect until specifically waived or released in a written document executed by PG&E. Any such written waiver or release of a right, power, remedy or privilege on any one occasion shall not be construed as a bar to any right, power, remedy or privilege which PG&E would otherwise have on any future occasion. No single or partial exercise of any right, power, remedy or privilege by PG&E shall preclude any other or further exercise by PG&E of any other right, power, remedy or privilege. The rights and remedies provided in this Guaranty are cumulative and may be exercised singly or concurrently, and are not exclusive of any rights or remedies provided by law.

**(m) Notices.** All notices, requests, demands, and other communications required or permitted hereunder shall be in writing and shall be delivered, mailed, or sent by facsimile transmission to the address and to the individuals indicated below. Either party may periodically change any address to which notice is to be given it by providing notice of such change as provided herein.

If to Guarantor:

Quanta Services, Inc.  
2800 Post Oak Boulevard, Suite 2600  
Houston, Texas 77056  
Attention: General Counsel  
Facsimile: 713.629.7639

**If to PG&E: Pacific Gas and Electric Company**

Credit Risk Management  
77 Beale Street, Mail Code B28L  
San Francisco, CA 94105  
Fax: 415 973-7301

Any notice provided hereunder shall be effective upon actual receipt, if received during the recipient's normal business hours; or it shall be effective at the beginning of the recipient's next business

GUARANTY AGREEMENT

day after receipt, if received after the recipient's normal business hours. If notice is provided by facsimile, the sender shall be responsible for obtaining facsimile receipt confirmation.

IN WITNESS WHEREOF, the Guarantor has caused this Guaranty to be executed in its name by its duly authorized officer as of the date set forth below.

GUARANTOR: Quanta Services Inc.

By: John

Name: James F. O'Neill

Title: CEO

Date 2.2.16

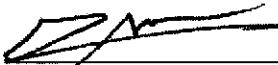
**Certificate of Incumbency**

This Certificate of Incumbency is attached to and forms part of the Parent Guaranty, dated February 2, 2016, for the benefit of Pacific Gas and Electric Company ("PG&E"), a California corporation with its headquarters located at 77 Beale Street, San Francisco, California 94105 and Quanta Energy Services, LLC, ("Contractor"), by Quanta Services, Inc., a Delaware corporation with its headquarters located at 2800 Post Oak Blvd. STE 2600, Houston, TX 77056. ("Parent"),

This Certificate of Incumbency confirms the identity and title of the Chief Executive Officer who is the Parent's authorized representative with the authority to enact the legally binding Parent Guaranty on behalf of Parent. Therefore;

I, Chief Counsel-Operations, of Quanta Services, Inc., DO HEREBY certify that as of the date of the Parent Guaranty signing, James F. O'Neil, who holds hold the office of the Chief Executive Officer, is authorized to execute the Parent Guaranty.

IN WITNESS WHEREOF, the undersigned has affixed his signature and the corporate seal of the Company this 2nd day of February, 2016.



---

Ryan Manthey  
Chief Counsel-Operations  
Quanta Services, Inc.

Attachment 7B Letter of Credit Template

DATE: [INSERT ISSUE DATE]

IRREVOCABLE STANDBY LETTER OF CREDIT NO. XXXXXXXX

BENEFICIARY:

[INSERT NAME OF BENEFICIARY AND ADDRESS}

ATTN:

APPLICANT:

[INSERT NAME OF APPLICANT AND ADDRESS]

LETTER OF CREDIT AMOUNT: [INSERT AMOUNT]

EXPIRY DATE: [INSERT EXPIRY DATE]

LADIES AND GENTLEMEN:

BY ORDER OF [INSERT NAME OF APPLICANT] ("APPLICANT"), WE HEREBY ISSUE IN FAVOR OF [INSERT NAME OF BENEFICIARY] (THE "BENEFICIARY") OUR IRREVOCABLE STANDBY LETTER OF CREDIT NO. [INSERT NUMBER OF LETTER OF CREDIT] ("LETTER OF CREDIT"), FOR THE ACCOUNT OF APPLICANT, FOR DRAWINGS UP TO BUT NOT TO EXCEED THE AGGREGATE SUM OF U.S. \$ [INSERT AMOUNT IN FIGURES FOLLOWED BY (AMOUNT IN WORDS)] ("LETTER OF CREDIT AMOUNT"). THIS LETTER OF CREDIT IS AVAILABLE WITH CITIBANK N.A., C/O ITS SERVICER CITICORP NORTH AMERICA, INC., 3800 CITIBANK CENTER, BUILDING B, 3<sup>RD</sup> FLOOR, TAMPA, FL 33610, ATTN: U.S. STANDBY DEPT. BY SIGHT PAYMENT, AT THE ADDRESS STATED ABOVE, EFFECTIVE IMMEDIATELY. THIS LETTER OF CREDIT WILL EXPIRE AT OUR CLOSE OF BUSINESS ON [INSERT EXPIRY DATE] (THE "EXPIRY DATE").

FUNDS UNDER THIS LETTER OF CREDIT ARE AVAILABLE TO THE BENEFICIARY AGAINST PRESENTATION OF THE FOLLOWING DOCUMENTS:

1. BENEFICIARY'S SIGNED AND DATED SIGHT DRAFT, IN THE FORM OF EXHIBIT A HERETO, REFERENCING THIS LETTER OF CREDIT NO. [INSERT NUMBER] AND STATING THE AMOUNT OF THE DEMAND; AND
2. ONE OF THE FOLLOWING STATEMENTS SIGNED BY AN AUTHORIZED REPRESENTATIVE OR OFFICER OF BENEFICIARY:
  - A. "[INSERT NAME OF APPLICANT, OR CONTRACTOR IF DIFFERENT FROM APPLICANT] ("CONTRACTOR") HAS FAILED TO PERFORM ONE OR MORE OBLIGATIONS UNDER CONTRACT NO. [INSERT THE NUMBER] OR A CONTRACT WORK AUTHORIZATION ISSUED UNDER THAT CONTRACT (THE "CONTRACT") BETWEEN CONTRACTOR AND PACIFIC GAS AND ELECTRIC COMPANY ("PG&E") OR ANY CHANGE ORDER UNDER THAT CONTRACT. THEREFORE, PG&E IS DRAWING UNDER LETTER OF CREDIT NO. [INSERT NUMBER] AN AMOUNT OWED BY CONTRACTOR TO PG&E"; OR
  - B. "LETTER OF CREDIT NO. [INSERT THE LETTER OF CREDIT NUMBER] WILL EXPIRE IN THIRTY (30) DAYS OR EARLIER AND [INSERT NAME OF APPLICANT, OR OF CONTRACTOR IF DIFFERENT FROM APPLICANT] HAS NOT PROVIDED REPLACEMENT SECURITY ACCEPTABLE TO PACIFIC GAS AND ELECTRIC COMPANY."

SPECIAL CONDITIONS:

1. PARTIAL AND MULTIPLE DRAWINGS UNDER THIS LETTER OF CREDIT ARE ALLOWED;

2. ALL BANKING CHARGES ASSOCIATED WITH THIS LETTER OF CREDIT ARE FOR THE ACCOUNT OF THE APPLICANT; AND
3. THIS LETTER OF CREDIT IS NOT TRANSFERABLE.
4. THE EXPIRY DATE OF THIS LETTER OF CREDIT SHALL BE DEEMED AUTOMATICALLY EXTENDED, WITHOUT AMENDMENT, FOR A PERIOD OF ONE (1) YEAR FROM THE PRESENT OR ANY FUTURE EXPIRY DATE, UNLESS AT LEAST SIXTY (60) DAYS PRIOR TO THE THEN CURRENT EXPIRY DATE, CITIBANK N.A. NOTIFIES YOU BY REGISTERED MAIL OR OVERNIGHT COURIER SERVICE AT THE ABOVE ADDRESS THAT CITIBANK N.A. ELECTS NOT TO EXTEND THIS LETTER OF CREDIT FOR AN ADDITIONAL PERIOD. HOWEVER, IN NO EVENT SHALL THIS LETTER OF CREDIT BE AUTOMATICALLY EXTENDED BEYOND 4:00 PM (LOCAL TIME IN THE PLACE OF CITIBANK N.A. ISSUING OFFICE) ON [INSERT DATE] (THE FINAL EXPIRY DATE).

WE ENGAGE WITH YOU THAT DRAFTS DRAWN UNDER AND IN COMPLIANCE WITH THE TERMS OF THIS LETTER OF CREDIT WILL BE DULY HONORED UPON PRESENTATION, ON OR BEFORE THE EXPIRY DATE (OR AFTER THE EXPIRY DATE IN CASE OF INTERRUPTION OF OUR BUSINESS AS STATED BELOW ), AT CITIBANK, N.A. , C/O CITICORP NORTH AMERICA, INC., 3800 CITIBANK CENTER, BUILDING B, 3RD FLOOR, TAMPA, FLORIDA 33610, ATTN: U.S. STANDBY DEPT.

ALL DEMANDS FOR PAYMENT SHALL BE MADE BY PRESENTATION OF ORIGINALS OR COPIES OF DOCUMENTS OR BY FACSIMILE TRANSMISSION OF DOCUMENTS TO 813-604-7187, ATTENTION: U.S. STANDBY DEPT. IF A DEMAND IS MADE BY FACSIMILE TRANSMISSION, THE ORIGINALS OR COPIES OF DOCUMENTS MUST FOLLOW BY OVERNIGHT MAIL, AND YOU MAY CONTACT US AT 866-945-6284 TO CONFIRM OUR RECEIPT OF THE TRANSMISSION. YOUR FAILURE TO SEEK SUCH A TELEPHONE CONFIRMATION DOES NOT AFFECT OUR OBLIGATION TO HONOR SUCH A DEMAND.

OUR PAYMENTS AGAINST COMPLYING PRESENTATIONS UNDER THIS LETTER OF CREDIT WILL BE MADE NO LATER THAN ON THE SIXTH (6TH) BANKING DAY FOLLOWING A COMPLYING PRESENTATION.

THIS LETTER OF CREDIT IS OUR INDIVIDUAL OBLIGATION, WHICH IS NOT CONTINGENT UPON REIMBURSEMENT AND IS NOT AFFECTED BY ANY AGREEMENT, DOCUMENT, OR INSTRUMENT BETWEEN US AND THE APPLICANT OR BETWEEN THE BENEFICIARY AND THE APPLICANT OR ANY OTHER PARTY.

ALL PARTIES TO THIS LETTER OF CREDIT ARE ADVISED THAT THE U.S.GOVERNMENT HAS IN PLACE CERTAIN SANCTIONS AGAINST CERTAIN COUNTRIES, INDIVIDUALS, ENTITIES, AND VESSELS. CITIGROUP ENTITIES, INCLUDING BRANCHES AND, IN CERTAIN CIRCUMSTANCES, SUBSIDIARIES, ARE/WILL BE PROHIBITED FROM ENGAGING IN TRANSACTIONS OR OTHER ACTIVITIES WITHIN THE SCOPE OF APPLICABLE SANCTIONS.

EXCEPT AS OTHERWISE SPECIFICALLY STATED HEREIN, THIS LETTER OF CREDIT IS SUBJECT TO AND GOVERNED BY THE *UNIFORM CUSTOMS AND PRACTICE FOR DOCUMENTARY CREDITS, 2007 REVISION*, INTERNATIONAL CHAMBER OF COMMERCE (ICC) PUBLICATION NO. 600 (THE "UCP 600"); PROVIDED THAT, IF THIS LETTER OF CREDIT EXPIRES DURING AN INTERRUPTION OF OUR BUSINESS AS DESCRIBED IN ARTICLE 36 OF THE UCP 600, WE WILL HONOR DRAFTS THAT COMPLY WITH THIS LETTER OF CREDIT, IF PRESENTED WITHIN THIRTY (30) DAYS AFTER THE RESUMPTION OF OUR BUSINESS, AND WILL EFFECT PAYMENT ACCORDINGLY.

THE LAW OF THE STATE OF NEW YORK SHALL APPLY TO ANY MATTERS NOT COVERED BY THE UCP 600.

FOR TELEPHONE ASSISTANCE REGARDING THIS LETTER OF CREDIT, PLEASE CONTACT US AT 866-945-6284.

VERY TRULY YOURS,

[INSERT NAME OF ISSUING BANK]

BY: \_\_\_\_\_  
AUTHORIZED SIGNATURE

NAME: \_\_\_\_\_ [PRINT OR TYPE NAME]

TITLE: \_\_\_\_\_

EXHIBIT A

SIGHT DRAFT

REPLACE WITH A DRAWING CERTIFICATE WITH REPRESENTATION CLAUSE AS WRITTEN IN 2.B. OF THE LOC.

TO  
CITIBANK N.A.  
C/O ITS SERVICER CITICORP NORTH AMERICA, INC.  
3800 CITIBANK CENTER, BUILDING B, 3<sup>RD</sup> FLOOR  
TAMPA, FL 33610  
ATTN: U.S. STANDBY DEPT.

AMOUNT: \$ \_\_\_\_\_ DATE: \_\_\_\_\_

AT SIGHT OF THIS DEMAND PAY TO THE ORDER OF [INSERT NAME OF BENEFICIARY] THE  
AMOUNT OF U.S.\$ \_\_\_\_\_ ( \_\_\_\_\_ U.S. DOLLARS)

DRAWN UNDER CITIBANK N.A. LETTER OF CREDIT NO. XXXXXX.

REMIT FUNDS AS FOLLOWS:

[INSERT PAYMENT INSTRUCTIONS]

BENEFICIARY

BY:

NAME AND TITLE

**SPECIFICATION**  
**ELECTRIC TRANSMISSION, DISTRIBUTION SUBSTATION AND**  
**TRANSMISSION LINE CONSTRUCTION**

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MSA 4400010156

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## 1. GENERAL REQUIREMENTS

### 1.1 GENERAL

1.1.1 **PURPOSE:** The purpose of this document is to establish requirement under which PG&E and Contractor may contract for Electric Transmission and Distribution Substation and Transmission Line Engineer, Procure and Construct (EPC) Work as defined under the terms and conditions of Master Services Agreement No. 4400010156 and as specified in each duly authorized Contract Work Authorization ("CWA") to provide engineering, procurement, and construction services for PG&E. In the event that PG&E desires the performance of such Work by Contractor, Work will be explicitly described in detail in a Contract Work Authorization (CWA) and signed by both Parties.

1.1.2 **REFERENCED DOCUMENTS AND SPECIFICATIONS:** PG&E will typically furnish all required documents to provide the Contractor a basis from which to develop an accurate Proposal and/or Work Scope. Section F Table 1, included at the end of these Specific Conditions, is a list of applicable Technical Specifications, templates and documents required for the preparation of Contractor's Proposal and the development of Work Scope. Contractor is responsible for ensuring receipt of all documents referenced in Table 1. These documents and all revisions thereto are available to Contractors with PG&E approved access or provided laptop through the link: <\\Fairfield02\etcse\EPC CONTRACTORS DOCUMENTS>. PG&E expects Contractor's Proposal and Work Scope to be fully informed and accurate and no change orders will be issued should Contractor's Proposal or Work Scope fail to account for the requirements provided for in the documents listed in Table 1.

### 1.2 DEFINITIONS:

Capitalized terms which are used in these Specific Conditions but not defined shall have the same meanings as assigned in the General Conditions. In addition, the following definitions shall apply:

1.2.1 **"PG&E Inspector":** Authorized PG&E representative assigned to make detailed examinations of the Work in progress or completed in order to determine its compliance with the Contract requirements and Specifications.

1.2.2 **"Project Manager":** defined as the person responsible for accomplishing the stated project objectives. Key project management responsibilities include creating clear and attainable project objectives, building the project requirements, and managing the constraints.

1.2.3 **"QA/QC":** defined as Quality Assurance/Quality Control.

1.2.4 **A.2.10. "Site":** defined as the physical location where the Work will be performed.

### 1.3 ACCEPTANCE:

Unless otherwise specified in CWA, if the Project Scope under a CWA requires Contractor to provide a deliverable, e.g., report, calculation, drawing, etc., a draft of the deliverable must first be provided by Contractor to PG&E's Project Manager for review and possible acceptance. PG&E will review the drafts and, if necessary, return them to Contractor with comments and/or requested revisions or modifications. Revisions made to the draft that are within the scope of Work of the CWA shall be performed by Contractor at no additional cost to PG&E and the revised draft shall be delivered to PG&E by the date

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stated in the CWA for further review and final acceptance in accordance with the terms of this Contract and the CWA.

**1.4 ELECTRONIC FILE:**

Contractor shall also provide PG&E with an electronic file of all final engineering drawings. These files shall typically be in Intergraph (.DWG) or AutoCAD (.DXF) formats, or as required by the PG&E Work Supervisor. Contractor shall confirm Project Specific CADD/Drafting requirements, which will be provided to Contractor from the PG&E department issuing Work and will be set forth in the CWA at the time the CWA is issued.

**1.5 EQUIPMENT GUARANTEES / TRANSFORMER REMEDIES:**

- 1.5.1 **RESPONSE TIME:** Within 72 hours after receipt of a notice of defect or nonconformity from PG&E, Contractor will make a field service technician available to consult with PG&E and will provide an estimate as to the time within which the necessary repair or replacement can be completed by Contractor. PG&E shall take all reasonable steps to ensure that Contractor's personnel have clear access to the Work for purposes of repair and replacement efforts.
- 1.5.2 **PREPARATION COSTS:** As used in this Article, "Preparation Costs" are defined as the costs to prepare an installed transformer for warranty service, including but not limited to, the cost of removal from site (de-energization / re-energization, removal and placement on the pad), loading and unloading transformers onto Contractor's vehicle at the PG&E facilities, transportation of the transformers to and from the warranty repair facility, reinstallation after repair and moving structures of any associated equipment. The Parties shall bear the Preparation Costs associated with the warranty repairs as follows: (i) for warranty repairs for which PG&E notifies Contractor one year or less from the start of the Warranty Period, Contractor shall bear the Preparation Costs; and (ii) for warranty repairs for which PG&E notifies Contractor more than one year after start of the Warranty Period, PG&E shall bear the Preparation Costs.

**1.7 CODES AND STANDARDS**

**1.7.1 PG&E STANDARDS:**

PG&E standards, referenced documents, Attachments and drawings included with a CWA or Specification shall be used by the Contractor as guidelines for the engineering, design and construction of the Project only.

**1.8 PROTECTION:**

- 1.8.1 All protection Work shall be performed in accordance with industry standards (IEEE, ANSI and where appropriate WECC requirements) and in conjunction and correlation with PG&E's transformer bank, line and bus protection standards, with similar test switch style, terminology, and nameplate conventions. In the event of conflict between industry standards and PG&E standards and practices, the Contractor shall request and obtain a written clarification from PG&E before proceeding.

**1.9 INDUSTRY STANDARDS:**

- 1.9.1 The Project shall be governed primarily by NESC, IEEE, and ANSI standards. Unless otherwise specifically stated in this Specification, the Work shall comply with the latest applicable standards. Any discrepancies between this Specification and the above mentioned applicable standards shall be brought to the attention of PG&E by the Contractor. Some of the applicable standards include, but are not limited to, the following:

STANDARD	DESCRIPTION
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STANDARD	DESCRIPTION
CAL-OSHA	General Industry Safety Orders
OSHA-US	U. S. Department of Labor Occupational Safety and Health Administration, OSHA 2206 General Industry Standards (29 CFR 1910), and OSHA 2207 Construction Industry (29CRF 1926/1910
CBC	California Building Code, ICC International Code Council
AASHTO-M181	1989 Standard Specification for Chain Link Fence
ANSI/IEEE	Institute of Electrical and Electronic Engineers, 445 Hoes Lane, Piscataway, NJ 08855
ANSI	American National Standards Institute, 11 west 42 <sup>nd</sup> Street, NY, NY 10018
C37.90	Relays and Relay Systems Associated with Electric Power (R1982) Apparatus
C37.90.1	Standard Surge withstand Capability (SWC) Tests for Protective Relays and Systems
C37.90.2	Standard withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers
C37.98	Standard for Seismic Testing of Relays
C37.110	IEEE Guide for the Application of Current Transformers used for the Protection Relaying Purpose
C57.12 .00	General Requirements for Liquid-Immersed Distribution, Power, and Regulating Transformers
C57.13.3	Guide for the Grounding of Instrument Transformer Secondary Circuits and Cases
C57.13	Requirements for Instrument Transformers
C62.11	Metal Oxide Surge Arrestors for Alternating-Current Power Circuit
Z55.1	Gray Finishes for Industrial Apparatus and Equipment (R1973)
IEEE 4	Techniques for High Voltage Testing
IEEE 693	Recommended Practices for Seismic Design of Substations
ANSI/IEEE 979	Guide for Substation Fire Protection
IEEE 80	Guide for Safety in AC Substation Grounding
IEEE 525	Guide for the Design and Installation of Cable Systems In Substations

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STANDARD	DESCRIPTION
IEEE 1246	IEEE Guide for Temporary Protective Grounding Systems Used in Substations
NFPA	National Fire Protection Association Battery March Park Quincy, MA 02269
70	National Electric Code (NEC)
NMFC	National Motor Freight Classification 1616 "P" Street, NW, Washington, DC 20036

1.9.2 OTHER STANDARDS

- 1.9.2.1 ACI 349 Code Requirements for Nuclear Safety Related Concrete Structures, American Concrete Institute (ACI)
- 1.9.2.2 ACI 318 Building Code Requirements for Reinforced Concrete, latest revision, American Concrete Institute (ACI)
- 1.9.2.3 AISC - American Institute of Steel Construction: Specification for Structural Steel Buildings, latest revision.
- 1.9.2.4 AISC American Institute of Steel Construction, Steel Construction Manual, latest revision.
- 1.9.2.5 AISC Seismic Provisions for Structural Steel Building, latest revision.
- 1.9.2.6 G. 0. 95 - State of California Public Utilities Commission, General Order No. 95, Rules for Overhead Line Construction
- 1.9.2.7 AWS D1.1 - American Welding Society: Structural Welding Code
- 1.9.2.8 DOT/PF Standard Specification Section 111

1.10 PROJECT MANAGEMENT

- 1.10.1 CONTRACTOR'S PROJECT MANAGER: Contractor is required to provide Project Management, during the design, procurement, fabrication, delivery, and construction/testing/ commissioning and contract closeout phases of the Project.
- 1.10.2 PROJECT MANAGER DUTIES: Contractor shall provide a Project Manager for this Project. The duties will include as a minimum the following:
  - 1.10.2.1 Coordination and supervision during the Project design, procurement, fabrication, shipping, delivery, receiving of all material required under this Contract.
  - 1.10.2.2 Monthly reports shall be submitted with project progress, including updated schedule, progress of all activities and deliverables, budget, cash flow, safety, reliability, supplier diversity, action items, open items, and potential change orders, any issues and the strategies and resolutions thereof.
  - 1.10.2.3 Supervise and be responsible for all negotiations of contract, including Change Orders, with PG&E.
  - 1.10.2.4 Owner of Project Schedule: Contractor's Project Manager shall in collaboration with PG&E complete and maintain a written up-to-date schedule

indicating the sequence and duration of various activities, including without limitation, design, document preparation, bidding and award of contracts and subcontracts, negotiation, and other pre-construction activities and construction of the Project. The Project Schedule shall establish dates by which any information or deliverables are to be provided or tasks are to be accomplished by either Party.

## 1.11 CONTRACTOR'S PROJECT CONSTRUCTION MANAGEMENT REQUIREMENTS

### 1.11.1 PROJECT CONSTRUCTION MANAGER: Contractor shall provide a Project Construction Manager who will be the on-site single point of contact, under the direction of the Contractor's Project Manager, with offices at the job site.

1.11.1.1 Provide construction management services during the construction, installation, testing and commissioning phases of this Project.

1.11.1.2 Provide formal construction inspection and associated documentation, including reports every day of labor, material and equipment costs, as applicable for time and material work.

1.11.1.3 Prepare a procedure detailing pre-commissioning and commissioning tests of installed equipment, identifying interfaces between Contractor and PG&E. This program is to be submitted to PG&E for Acceptance.

1.11.1.4 Maintain at the Project site on a current basis: Project Progress Reports, records of all drawings, specifications and addenda, shop drawings, samples, schedules, applicable handbooks, Federal, State and Municipal Building Codes, all collective bargaining agreements if applicable, effective labor rates and any other related documents and revisions which arise out of the Contract for the Work.

1.11.1.5 With PG&E's maintenance and test personnel check out all utilities, operational systems and equipment for readiness and assist in their initial start-up and testing.

1.11.1.6 Conduct weekly job meetings with Subcontractor(s), which will be attended by PG&E. These meetings shall be conducted formally, with a stated agenda and documented with weekly conference notes. All action items and open items shall be stated clearly. All potential Change Orders shall be discussed among the parties, actions with regards to resolutions of these shall be documented, and resolution action items shall be established.

1.11.1.7 Each of the Subcontractors shall be required to attend job meetings scheduled by the Construction Manager. Decisions and schedules agreed upon at such meetings shall be binding upon all Subcontractors whether present or absent.

1.11.1.8 Provide appropriate time for the inspection, investigation or detail drawings required by PG&E to make decisions relating to the Work under this Contract.

1.11.1.9 Attend the Project construction meetings.

1.11.1.10 Provide Project coordination of Work of others:

1.11.1.11 Each Subcontractor(s) shall be responsible for the coordination of everything incidental to or requisite for the completion of its Work.

1.11.1.12 Each Subcontractor(s) shall arrange its Work and shall place and

dispose of the materials being used so as not to interfere with the operations of others. Subcontractor(s) shall join its Work with that of others in an acceptable manner and shall perform it in a proper sequence to that of others.

1.11.1.13 Provide construction coordination between Contractor, Subcontractor(s) and PG&E.

1.12 CONTRACTOR'S FIELD ENGINEER (FE)

1.12.1 Contractor's FE shall coordinate with PG&E's Field Inspector during all phases of construction activity, including completion of As Built drawings. The FE shall receive, inspect, inventory, and process all Contractor furnished material equipment and material. The functions that shall be performed shall include but not be limited to the following:

- a) Reconciliation with PO Documentation
- b) Part No. verification and compliance with PG&E Material Codes.
- c) Damage Inspection
- d) Material Discrepancy Resolution.
- e) Material Receipt Documentation.
- f) Collecting the field as built drawings.

1.12.2 The Contractor's FE along with Construction Manager shall provide a single point contact and shall be responsible to provide clarifications and/or field engineering/design clarifications in an expeditious manner to the PG&E Inspection Staff. The scope of assistance shall encompass all design activities of the Contractor and their proper implementation by Contractor's construction crews, and ensure that the construction activities are in strict conformance with PG&E accepted Contractor's design deliverables.

1.13 PG&E'S CONSTRUCTION MONITORING

1.13.1 PG&E FIELD INSPECTOR: PG&E's Field Inspector or his/her designee will be PG&E's representative during the construction and installation phases of the Project.

1.13.1.1 PG&E's Field Inspector in cooperation with Contractor's Construction Manager shall coordinate the Work of Contractor with the activities and responsibilities of PG&E to complete the Project in accordance with PG&E's objectives. The Field Inspector will provide sufficient personnel at the Project site with authority to achieve these objectives. Without in any way limiting Contractor's performance obligations under this Contract, the Field Inspector's duties will include the following:

1.13.1.2 Monitoring of Contractor's construction and staff. If necessary, inform Contractor of Work, which does not conform to the requirements of the Contract Documents. He/she may elect to stop the Contractor's activities if in his/her opinion safety is of question or if such activities impose any undue risk to damaging any equipment.

1.13.1.3 Attend weekly Project construction meetings with Contractor's Construction Manager.

1.13.1.4 Review Contractor's detailed schedule for the operations of Subcontractor(s) on the Project, including realistic activity sequences and durations, milestones, allocation of labor and materials and processing of test samples; included are PG&E's occupancy requirements showing portions of the Project having occupancy priority if any.

- 1.13.1.5 Provide regular monitoring of the Project Schedule as construction progresses. Identify potential variances between scheduled and probable completion date/milestones. Review schedule for Work not started or incomplete and suggest adjustments in the schedule to meet the completion date.
- 1.13.1.6 Monitor the procedures for expediting the processing and Acceptance of shop drawings and test samples.
- 1.13.1.7 Coordinate with the Construction Manager and PG&E's operating personnel participating in the pre-commissioning and commissioning tests.
- 1.13.1.8 Upon determination of completion of the complete construction, installation and tests, except energization, prepare with Contractor's Project Manager and Construction Manager a list of incomplete or unsatisfactory items (punch list) and a schedule for their completion. The Construction Manager shall supervise the corrections and completion of Work prior to the start of commissioning tests.
- 1.13.1.9 Determine, with the assistance of PG&E's operation personnel, completion of all required Work and that the Project is ready for commissioning tests.

## 2. SUBSTATION CONSTRUCTION REQUIREMENTS

### 2.1 SITE INFORMATION AND REQUIREMENTS

- 2.1.1 GENERAL: This Section covers the site preparation and the installation of Work and all new equipment as described in within these Specific Conditions. All Work shall comply with the requirements of the Master Service Agreement, the CWA, the Specifications and accompanying documents, and shall include the furnishing of all construction labor, material, tools, instruments, equipment, and facilities required. All Work necessary to make the complete installation ready for operation shall be performed and considered as included in the prices quoted for Work, whether or not specifically classified for payment under the items of the Bid Forms. All Work shall be subject to inspection and approval of PG&E.
- 2.1.2 The Contractor shall furnish all labor, equipment, materials and services to clear and grade the site and to design and install site drainage as required. The Contractor is also responsible for disposal of cleared materials, except as otherwise provided in this Specification.

The Work shall include all services required to plan, design, and layout and construct the Project and shall include, but not necessarily be limited to the following:

- 2.1.2.1 All major equipment and associated accessories shall have the smallest practical physical layout keeping in mind all maintenance access requirements and safety clearances.
- 2.1.2.2 Compliance with County, State and Federal Environmental Regulations.
- 2.1.2.3 Erosion and sediment control, and non-storm water discharge control during construction and during operation of the facility per PG&E Water Quality Construction BMP Manual (Document 71 from Table 1).
- 2.1.2.4 Site clearing and disposal of trees, brush, debris, etc.
- 2.1.2.5 Site grading, including all excavation and fills.
- 2.1.2.6 Safety, such that Contractor shall perform Work in an energized substation.
- 2.1.2.7 Site drainage.

2.1.2.8 Shoring of existing structures, when required for structural stability and safety.

2.1.2.9 Compliance with CAL/OSHA requirements.

2.1.2.10 Existing structures and utilities, which are adjacent to or within the limits of the area to be cleared and graded, shall be protected against damage. The Contractor shall be fully responsible to PG&E for all repairs or loss in the event of removal or damage of any existing structures, equipment or systems that are intended to remain in place.

## 2.2 CONTRACTOR PERFORMANCE AND CONDUCT OF WORK

2.2.1.1 General: Contractor's performance of Work hereunder shall be to the satisfaction of PG&E. Responsibility to complete and guarantee the Work as specified shall remain with Contractor. Contractor's Work shall be carried out in accordance with sound professional procedures and practices generally accepted within the construction industry and jointly with other operations at the site.

2.2.1.2 Compliance with Regulations and Orders: Contractor shall be fully informed and shall comply with all regulations and orders of governmental authorities which may affect the conduct of the Work hereunder, particularly in regard to disposal of waste material and clearing or burning of combustible material.

2.2.1.3 Construction Schedule: The Work performed under this Contract shall be planned and completed in accordance with the Project Schedule submitted as part of Contractor's required submittals specifying the required Completion Date. Contractor shall make the completed Project available for full commercial operation by the Completion Date established in the CWA.

2.2.1.4 Timely Performance: Contractor shall perform the Work in as short a time as practicable consistent with good and safe workmanship without overtime, unless otherwise specified herein. Contractor shall schedule and perform its Work as to complete it in accordance with Contract milestone and completion dates. Failure to meet such completion requirements can cause significant damage to PG&E, including direct cost to recover time lost, Claims paid to other contractors resulting from Contractor's delay, additional cost of inspection and project administration, additional actual cost of project financing, Third Party liabilities related to PG&E's operations, and damage to PG&E's customers and business associates. Contractor shall be responsible for developing and updating all engineering design, construction and installation work requirements, as well as, equipment and material procurement allowing necessary time for all PG&E required reviews to meet the construction deadline.

2.2.1.5 Coordination: The Project shall be designed and installed in close coordination with scheduled clearances and test pre-requisites. Contractor shall also plan and execute the sequence of construction, and clearances in accordance with the requirements of the Construction Plan, including all required forms covering contractor as well as PG&E supplied equipment.

2.2.1.6 Communication: Contractor shall hold weekly meetings with the PG&E's Project Manager. The focus of the meeting is to identify problems or events that could impact the Project schedule and propose plans of action to mitigate negative impacts. Potential Change Orders shall be discussed during these meetings, and action items and responsibility for resolution of these actions items shall be clearly established.

2.2.1.7 Delivery and Care of Materials and Equipment

2.2.1.7.1 Off-loading, receiving, storage, and quality and inventory control of materials and equipment, required for the Work under the Contract, shall be the sole responsibility of Contractor. All Work shall be performed to the satisfaction of PG&E, but this shall not be construed as to relieve Contractor of the responsibility to complete and guarantee the Work as specified.

2.2.1.7.2 Contractor shall maintain apparatus, equipment, and material in good condition at Work site, prior to and during installation, and shall be responsible for any

loss, cleanliness, or damage of these items due to pilferage, lack of skill or negligence of Contractor's personnel.

2.2.1.7.3 It shall be Contractor's responsibility to ensure that equipment is stored and maintained in accordance with manufacturer's instructions and recommendations.

2.2.1.7.4 Upon receipt at job site, electrical equipment, such as motors, reactors, heaters, and similar equipment, is to be monitored and the testing results documented once every 30 days while in storage, and once after installation.

2.2.1.7.5 Cribbing: Contractor shall place material and equipment on temporary cribbing at the specified storage lay-down area in the most convenient manner, subject to approval by PG&E. Contractor shall provide cribbing material during the time equipment is stored. Contractor will identify cribbing, if any, for disposal by PG&E. In conjunction with and as required by PG&E's Inspector, Contractor shall arrange immediately upon delivery to inspect and check material and equipment delivered to the work site to verify that items are received in good condition and to allow PG&E's Inspector to record properly the receipt and condition of these items. After the material and equipment have been checked and recorded, PG&E's Inspector will release these items to Contractor, and these items shall, during and after inspection, remain Contractor's sole responsibility for safekeeping, storage, handling, and installation.

2.2.1.7.6 PG&E's Inspector will employ whatever method it may deem necessary to properly record the release of these items. Items in storage shall remain crated or as otherwise protected when received, if the protection is suitable to PG&E. Care shall be taken to maintain the integrity of the crating and protective covering. Special care shall be taken when handling electronic equipment including keeping boxes out of the rain. When boxes are opened, PG&E's representative shall be present. Contractor shall take necessary precautions to protect the material and equipment from damage or loss. Contractor shall also be responsible for any waste or damage resulting from accidents, carelessness, negligence, or lack of skill on the part of his workmen, and for material and equipment lost or pilfered by his workmen or others.

2.2.1.7.7 In general, equipment delivered to work site will be in components and subassemblies and will be shipped to comply with shipping and other limitations. Contractor shall not make any claims for loss or credit arising from the required assembling of these parts due to the difference between the assumed and actual disassembly of parts as delivered to work site. Crating, protective material, and Dunnage shall be removed by Contractor from the work site after use and disposed of by Contractor as directed by PG&E.

2.2.1.7.8 Proving Existing Underground Services: Contractor shall prove all underground utilities, such as telephone cables, electrical conduit, sewer lines, water lines, etc., that are shown on the approved construction drawings or that are known to exist in the Work area. Contractor shall not solely rely on the locations shown on the drawings. Contact PG&E Inspector on site for instructions concerning probing existing underground utilities for instructions.

2.2.1.7.9 Damage to Existing PG&E Facilities: In the event that Contractor damages existing facilities, Contractor shall notify PG&E within 4 hours of such occurrence. PG&E's Project Manager shall determine if Contractor may repair or replace damaged facilities. Without limitation of any indemnification obligations set forth in the Contract, in the case of PG&E facilities being damaged due to negligence of Contractor's personnel, responsibility for all the cost incurred shall be borne by Contractor.

2.2.1.7.10 Obstructions: Contractor shall remove all existing obstructions to the Work area only as directed by PG&E. Removed obstructions shall be repaired or replaced as directed by PG&E.

2.2.1.7.11 Trespassing: Contractor shall not allow any employee, subcontractor or agent to trespass on premises or lands in the vicinity of the Work without prior approval of

landowners, or to commit any nuisance or act of vandalism thereon.

2.2.1.7.12 Fire Regulations: Contractor shall comply with the requirements of the California State Division of Forestry Fire Prevention Bureau and the Regulations of the Public Resources Code, Section 4167, which governs the use of spark arrester devices on all motorized equipment. (See Document 66 from Table 1)

2.2.1.8 Cleaning Up:

2.2.1.8.1 Contractor shall maintain clean and orderly work and storage areas at all times during the progress of Work. At the conclusion of the project Cleaning Up, will be rigidly enforced.

2.2.1.8.2 Contractor shall maintain the Work area in a clean condition and shall remove all waste material and rubbish from the work site daily or as directed by PG&E. Contractor shall supply dump boxes for rubbish and haul them from jobsite as directed by PG&E. At the completion of Work, Contractor shall remove all tools, equipment, waste material, and rubbish from the work site and shall leave the area in a clean and orderly condition.

2.2.1.8.3 All combustible material, fencing material, spoil, debris or other material on or around the work site that was created by Contractor's Work shall become Contractor's property to be removed from PG&E's property. Burning of material on PG&E's property will not be allowed.

2.2.1.8.4 Excess spoils, dirt, asphalt shall be tested by PG&E. If spoils test "clean" spoils shall be released to Contractor using the Agreement and Release from Liability form. Unit cost (price/ton) of spoils removal shall be quoted in Bidder's proposal and performance of such work shall be at the sole option by PG&E (Include unit cost information request in the proposal form). If PG&E's spoils tests indicate certain contaminated levels of hazardous materials are present, such work shall be excluded from the CWA. (Note: Only Contractors with applicable hazardous material licenses shall handle and transport hazardous materials).

2.2.1.9 Dust Control:

2.2.1.9.1 Contractor shall control airborne dust by use of water, a dust palliate or other means on outside Work areas to meet government requirements or as directed by PG&E. Contractor shall be responsible for any damage or additional maintenance expenses incurred by PG&E or others, which result from airborne dust from Contractor's operation.

2.2.1.9.2 Contractor shall be responsible for procuring water to be used for dust control.

## 2.3 WORK SITE FACILITIES

2.3.1 SITE ACCESS ROADS AND PARKING: The Contractor shall gain access to the site from existing public and private roads. PG&E shall assure rights and reasonable means of ingress to and egress from the Worksite for Contractor and its Subcontractors sufficient for the performance of the Work, including any access roads. Existing roads shall not be blocked or restricted without prior approval of PG&E. Contractor may use only those means of access directed by the PG&E Inspector. Contractor is responsible to repair, at its cost, any damage to roads and substation surfacing caused by Contractor's operations during the performance of this Work. Parking facilities at the work site will be provided to Contractor for company vehicles and equipment. No vehicles other than those authorized by PG&E will be permitted to park in the Work area. Parking for the Contractor's employees' private vehicles will be designated by Contractor in the area assigned by the PG&E Inspector

2.3.2 WORK SITE PROPERTY RIGHTS: PG&E shall be responsible for obtaining necessary real

property rights for performance of the Work, including rights for power lines, water lines (make-up and domestic), waste water lines, and sewer lines, whether on or off the Worksite; provided, that Contractor shall make reasonable adjustments in the location of such lines as necessary to facilitate PG&E's receipt of such property rights. Such adjustments shall in appropriate cases be subject to treatment as changes under this Agreement. PG&E shall specify who will supply and pay for all construction power and water and other construction utilities in the CWA

2.3.3 SANITARY CONVENIENCES: Contractor shall provide any necessary sanitary conveniences and remove them upon completion of the Work. These facilities shall be kept in a clean and sanitary condition at all times. Facilities shall comply with applicable state and local governmental regulations.

2.3.4 WATER: Contractor shall furnish all water necessary for the needs of its employees or Subcontractors. This includes drinking water or any other water necessary to perform the Work. Water supplied for construction shall be of a quality suitable for use in the manufacture of concrete or grout, for curing of concrete structures, and for other construction activities requiring the use of water as a cleaning agent, a mix ingredient, a wetting agent, wash down, or as otherwise specified.

#### 2.4 TELEPHONE FACILITIES:

2.4.1 There are no existing telephone facilities at the Work site that can be made available to Contractor. Contractor shall make any arrangements necessary to obtain telephone service.

#### 2.5 TEMPORARY CONSTRUCTION FACILITIES

2.5.1 Contractor shall review with PG&E's Project Manager or his/her Representative where it proposes to locate its site facilities. Location of temporary structures, buildings and vehicle parking areas shall be subject to approval by PG&E.

2.5.2 Temporary structures constructed by the Contractor shall remain its property and shall be removed from the site at its own expense, immediately upon completion of the Work, and the area left in a clean and tidy condition.

2.5.3 Contractor shall maintain the site and structures free from advertisements and signs of any kind except those approved by PG&E's Representative in writing.

2.5.4 Contractor shall provide and maintain the following temporary construction facilities and pay all costs associated therewith:

2.5.5 Contractor shall erect a temporary fence separating the Contractor's Work area from the remainder of the substation to prevent entry to the substation as well as keeping unauthorized personnel out of the Contractor's Work area. Contractor shall coordinate the location of the fence with PG&E prior to its erection.

2.5.6 A temporary field office trailer which also can be used by its Subcontractors.

2.5.7 Storage area adequate for construction materials.

2.5.8 All temporary heating required during the construction and commissioning period.

2.5.9 Any first aid facilities necessary to conform to the regulations of the State of California Workers' Compensation Board.

#### 2.6 TEMPORARY POWER:

2.6.1 Contractor shall be responsible for the purchase, supply and maintenance of temporary construction power and its distribution to its various Work and yard areas. Contractor shall work with PG&E's on-site inspector to determine available sources.

2.6.1.1 PG&E will provide station service power sources as follows:

2.6.1.1.1 480/277 VAC, 208Y/120 V AC 60 Hz, three-phase, 4 -wire or station service 120/240VAC whichever is available for auxiliary devices such as lighting, receptacles,

etc. at one location in the vicinity of the work area.

2.6.1.2 125 VDC or 48VDC from a station battery for protective and control circuits.

## 2.7 JOBSITE CONDUCT

- 2.7.1 Contractor's employees, agents, and Subcontractors shall not keep firearms, bows and arrows, or any projectile firing implements on their person or in their vehicle. No alcoholic beverages or illegal drugs are allowed on the Work sites.
- 2.7.2 Contractor's employees, agents, and Subcontractors shall abide by the PG&E Drug and Alcohol Abuse and Testing Policy stated in Exhibit 2, of the Master Service Agreement. This policy shall be part of any subcontract issued by the Contractor.
- 2.7.3 Driving Vehicles: Contractor shall be responsible for the safe driving practices of personnel while within the Work area.
- 2.7.4 Operation of PG&E Equipment: Contractor shall not open or close any switches on PG&E operating equipment.
- 2.7.5 Conflicts between the general public (and specifically PG&E's customers) and the Contractor or Subcontractor's employees will not be tolerated. Contractor is responsible for its employees' conduct and will be held liable for all costs related to their misconduct. Contractor shall respect the rights of the general public, and especially PG&E's customers, at all times. The Contractor shall strive at all times to be courteous to all customers affected by the Work performed under this Specification as well as all members of the general public. The Contractor shall ensure that the conduct of its employees or Subcontractor's employees is of a professional manner, and shall not allow its employees to play radios, use profanity, use abusive language, or display gestures which could be interpreted by the customer or general public as offensive or obscene.
- 2.7.6 Violations of Section B.1.3.8 by any person will be grounds for removal from the Work site and for replacement.
- 2.7.7 The provisions of this Contract shall apply to Subcontracts. Contractor shall specifically include each term found in this Section B.1.3.8 in any subcontract it may issue for performance of any portion of the Work.
- 2.7.8 PERMITS: All supporting documents requiring design inputs for PG&E to obtain the required permits shall be prepared and submitted by the contractor within 5 working days of acceptance after the Outdoor Design Review. (See Document 60 from Table 1, for Design Review Process).

## 2.8 DRAINAGE AND YARDWORK:

- 2.8.1 Contractor shall furnish all labor, equipment, materials, and services necessary to perform all design, site grading, drainage, and yard work associated with construction of the Project. Design of site earthworks shall conform to the requirements of PG&E's Design Criteria 073101 (Document 77 from Table 1). Construction activities involving grading and paving work shall conform to PG&E's Civil Design Standard 041838 (Document 3 from Table 1) and Section 5.1.7 of Design Criteria 073101. The Contractor shall provide and implement a Storm Water Pollution Protection Plan (SWPPP), if required.
- 2.8.2 Erosion and Sediment Control: Contractor shall provide, operate, and maintain all temporary and permanent ditches, culverts, berms, site grading, detention basins, sumps and pumps to divert, collect and/or remove all water including rain water from the Work areas. The Contractor shall insure that such water control does not result in erosion or sedimentation. All water shall be directed to areas away from the Work area and discharged at locations approved by PG&E.
  - 2.8.2.1 In addition, Contractor shall comply with the intent of the requirements for erosion and sediment control outlined in DOT/PF Standard Specification Section 111.
  - 2.8.2.2 Contractor shall be responsible for implementing and maintaining all applicable

Best Management Practices (BMPs) listed in PG&E's Water Quality Construction Best Management Best Practices Manual to control the off-site migration of pollutants, including sediment, hazardous materials, and hazardous wastes (See Document 71 from Table 1).

2.8.2.3 Excavation: Contractor shall perform all common and deep excavation necessary for installation of all foundations and utilities. Excavation shall be performed to the limits necessary for construction of the facilities shown on the drawings.

2.8.2.4 Contractor shall be responsible for providing stable and safe excavated slopes or continuously shored vertical slopes, which meet OSHA requirements for such Work.

2.8.2.5 All excavated materials shall be utilized for backfill or embankment if suitable for this application. Unsuitable or excess excavated material shall be properly disposed of.

2.8.2.6 Contractor shall verify that earth materials exposed in excavations are consistent with those assumed for the Contractor's foundation designs. If earth materials are different than assumed for particular foundation design, the Contractor shall modify the design and/or treat the earth material (over excavate, replace, etc.), as necessary to provide foundations meeting design requirements.

2.8.2.7 Construction Surveying: Contractor shall furnish all labor, equipment, materials and services necessary to perform all surveying and staking essential for the completion of the Project in conformance with the plans and specifications.

2.8.2.8 The Contractor shall retain qualified survey crews knowledgeable in proper and up-to-date survey techniques and shall use these qualified survey crews when conducting survey work. Such crew shall be under the supervision of a Professional Land Surveyor licensed in the State of California.

2.8.2.9 Survey markers, benchmarks, or monuments shall be marked in accordance with State or Federal statutes. Survey markers or benchmarks local to the facility site shall be stamped or marked in accordance with need or good surveying practice.

2.8.2.10 Fills: Earth fill materials adjacent to and below structures shall conform to the Contractors design requirements for the structure. Contractor prepared specifications and drawings shall indicate the types of soil to use for particular fills and compaction requirements. See PG&E Civil Design Standard 041838, General Notes for Grading and Paving for Substation.

2.8.2.11 Fill shall be placed as uniformly as possible on all sides of structural units. Fill placed against green concrete or retaining walls shall be placed in a manner, which will prevent damage to the structures and will allow the structures to assume the loads from the fill gradually and uniformly.

## 2.9 GRADING:

2.9.1 The grading shall be in accordance with PG&E Civil Specification No. 5217 Mod. 4 and Civil Design Standard 041838, Document No. 3, from Table 1.

## 2.10 FENCING:

2.10.1 Contractor is responsible for all necessary Work to meet the fencing requirements contained in Sections 5.7.1 and 5.7.2 of PG&E's Design Criteria 073101 (Document 77 from Table 1) and PG&E's standard drawings 3004471, and 059659 thru 059662 (Documents 5 thru 8 from Table 1).

## 2.11 GROUNDING:

2.11.1 The Contractor shall design, furnish and install a complete grounding system for the Project. If contractor decides for PG&E to do the safety grounding study and recommendation, contractor to send email to: **TESgroundingservices@pge.com** using the request forms as shown on Document 42C, from Table 1. Communications regarding the grounding study should be addressed to the PG&E grounding analysis doing such study. A report will be issued incorporating the study and the required grounding mitigation. It is the responsibility of the contractor to provide an accurate grounding layout for PG&E to initiate the grounding study using PG&E grounding standards as shown on Document 9, 42& 42A from Table 1. If contractor decides to do the grounding study, the latest version of the CDEGS® software by Safety Engineering Services (SES) shall be used. Fault duties required for grounding study shall be obtained from PG&E protection engineer assigned for the project. All grounding study by contractor shall be reviewed by PG&E for compliance with PG&E's substation grounding standards and design criteria.

2.11.2 Following completion of construction activities, the Contractor shall restore to original condition any portion of the station yard, roads, fences, and appurtenances damaged or altered as a result of construction activities. Grading and paving shall be performed as specified in PG&E Civil Design Standard 041838 (Document 3, from Table 1).

## 2.12 FOUNDATIONS AND CONCRETE WORK

2.12.1 GENERAL: The Contractor shall furnish all labor, equipment, materials and services to layout, design and construct the foundations and concrete work required for a complete and operable facility. In general, the foundations and concrete Work shall be similar to and blend with the existing concrete work at the substation. The Work shall include all services required to plan, design and construct foundations as specified in the scope of work and shall include, but not necessarily be limited to the following:

### 2.12.1.1 Design and use of formwork

## 2.13 MATERIALS:

2.13.1 Minimum 28-day strength for structural concrete shall be  $f_c=3,000$  psi. Deformed reinforcing bars shall have a specified yield strength of  $f_y = 60,000$  psi.

2.13.2 Concrete for slabs shall have a slump and 28-day strength conforming to the limits shown in ACI 30 for the appropriate class of floor based on usage. Slabs shall have levelness and flatness as identified in ACI 302 unless otherwise specified in the Project Specific Documents.

## 2.14 EQUIPMENT SUPPORT PADS:

2.14.1 Equipment support pads will be required under major pieces of equipment. Corners and edges of the pad shall be chamfered or finished with an edging tool."

## 2.15 ANCHOR BOLTS AND EMBEDDED ITEMS:

2.15.1 The quantity, size and location of anchor bolts for the enclosure and equipment shall be specified by the appropriate manufacturer. Embedded steel items shall be galvanized. Anchor bolts and embedded steel items subject to high corrosive atmosphere shall be fabricated from stainless steel. Contractor shall review with PG&E Civil for proper stainless material and application usage.

2.16 GROUT:

2.16.1 No grout is required to column baseplates per PG&E Civil Design Standard 056014. A non-shrink, non-metallic grout shall be used for this purpose. Each grouted column baseplate shall contain two 1" diameter or 1" square drain channels on opposite sides of the baseplate.

2.17 CONCRETE CONSTRUCTION:

2.17.1 Concrete shall be batched, mixed and delivered in accordance with the requirements of ACI 301. Reinforcing shall be detailed and fabricated in accordance with ACI 315. Details of concrete reinforcement not covered in ACI 315 shall be in accordance with the CRSI Manual. Non-ferrous reinforcing shall meet the requirement of ASTM C-1116 or ACI 440.1R. Concrete placing equipment and methods shall conform to the requirements of ACI 301, 304 and 318.

2.18 ENCLOSURES AND STRUCTURE DESIGN

2.18.1 Steel Structures: The Contractor shall furnish all labor, equipment, materials, and services to erect the steel structures required for a complete and reliable installation of the system.

2.18.2 Erection: Steel structures shall be erected so that they are complete with all required members. The completed structure shall be plumbed true and all pieces shall be fully and properly aligned.

2.18.3 Protective Coatings: All steel surfaces shall either be galvanized or painted. After erection, the Contractor shall be responsible for touch-up of all damaged areas for all enclosure and structural steel installed. Touch-up painting or galvanizing shall be in accordance with the requirements of PG&E Spec 81, Sect 8.2.

2.18.3.1 Enclosures: All enclosure steel surfaces shall have at least one primer coat and finish coat with the manufacturer's standard paint in a color approved by PG&E.

2.18.3.2 Structural Steel: All steel structures, other than the enclosures, shall be hot-dipped galvanized.

2.19 ELECTRICAL AND MECHANICAL WORK

2.19.1 GENERAL

2.19.1.1 This covers, in general, the requirements for workmanship and installation procedures that shall be followed for the Work covered by these Specific Conditions.

2.19.1.2 Material and workmanship shall conform to the applicable National Electrical Code, State Electrical Orders, and other applicable specifications.

2.19.1.3 Contractor shall assemble and install equipment complete with accessories and auxiliaries, neatly and accurately as recommended by the manufacturer, and as shown on the drawings, to the complete satisfaction of PG&E. In matters of dispute, PG&E's decision shall be final.

2.19.1.4 Prior to any excavation Work, PG&E's and Contractor's designated representatives shall jointly review all pertinent drawings. Drawings may include, but not be limited to, General Arrangements, Grading Diagrams and Conduits and Grounds. Contractor shall notify the responsible Project Inspector before starting any excavation Work.

2.19.1.5 Contractor shall be required to assign a qualified safety observer to each operator having excavation Work in progress. When working as a safety observer, the individual shall be dedicated to viewing and assisting with that Work only.

2.19.1.6 Unless otherwise authorized by PG&E, Backhoes shall have mud buckets or mud plates installed over teeth. Backhoes shall be grounded and barricaded whenever in use.

2.19.1.7 Prior to any backfilling Work, Contractor must receive an approved final inspection. Any backfilling done without PG&E's approval shall require Contractor, at its sole expense, to re-excavate that area for inspection.

2.19.1.8 Hand excavation shall be required in the following areas: 1) Any area within 10 feet of existing underground conduits; 2) any areas within five 5 feet of existing ground grid. Hand shovels are the only tools allowed to be used in hand excavation areas unless finish grade rock or chip seal is present. Under those conditions, Contractor shall be permitted to dig to a maximum depth of 6 inches using hand picks and or 45 lb. Jackhammers fitted with shovel blades only – No gads allowed! No other power equipment of any kind shall be allowed to Work below grade in any section designated as a hand excavation area.

2.19.1.9 To prevent accidental "Dig-Ins", Contractor shall be required to mark all hand excavation areas with fluorescent paint and install delineators to identify and secure these areas until that Work has been completed.

2.19.1.10 All hand excavation Work over energized underground feeder cables shall require Contractor to assign a qualified safety observer dedicated to viewing this Work only.

2.19.1.11 All equipment and materials removed and replaced during the course of this Project shall be turned over to PG&E at the job site for disposal. Foundations that are no longer required shall be removed to a depth of six (6) feet below grade. Contractor shall provide a crane, forklift or other appropriate lifting equipment to safely lift and place the removed equipment on transports for removal from the Substation. These activities shall be coordinated with the responsible PG&E Inspector at the site.

## 2.20 STRUCTURES

2.20.1 Care shall be exercised when handling structures. Structures shall be properly supported, and no parts shall be subjected to strain or stresses that may damage them. Nylon slings shall be used when handling structures. Contractor shall not use any metallic slings, such as cables or chains, to handle structures.

2.20.2 Any modifications to the structures required for mounting of equipment, such as drilling, reaming, welding, etc., shall be done in such a way as to not impair the structural integrity of the structure and shall be subject to the approval of PG&E.

2.20.3 Where fabricated supports are not indicated for use with switch plates and nameplates, Contractor shall mount the plates on the equipment by drilling for and bolting or screwing as may be required. The mounting of switch and nameplates shall meet the approval of PG&E.

2.20.4 Drilled holes shall be sprayed with cold zinc or equivalent to impede corrosion.

2.20.5 After structures are completely erected, properly aligned and tightened, Contractor shall place grout beneath column baseplates leaving weep holes for drainage.

2.20.6 Structures with ends of hollow section members or similar built up members shall be provided with metal cover either solid or screened (mesh openings no greater than 1 inch across), to prevent entry of animals after field erection.

## 2.21 GROUNDING SYSTEM

2.21.1 Conductors shall be cleaned thoroughly with abrasive paper, cloth, or wire brush at points of connection to insure good electrical connection. Connectors shall be tightened securely or torque. Fasteners shall be torqued as per this Section B.4.9.9. of these Specific Conditions.

2.21.2 Conductors installed in the ground shall be buried to depth of not less than 18 inches below finish grade unless indicated otherwise on the drawings.

2.21.3 Bare copper ground cable shall be taped before bending or cutting. Tape shall be removed after bending or cutting. Bend radius shall not be less than three times the diameter of the bare cable.

2.21.4 Ground rods to be installed as per design. Top of ground rods shall be driven to the same depth as the ground connecting cables. The full length of the ground rod shall be installed.

2.21.5 Unless indicated otherwise on the drawings or specifically permitted by PG&E, connections in buried ground conductors shall be made with Deutsch compression connectors (PG&E's preferred method of connecting ground conductors). If permitted by PG&E and Contractor plans to install exothermic (Cadweld or Thermoweld) type connections, they shall utilize weld materials per PG&E Engineering Standard No. 067910 (Document 42, from Table 1). Connections shall be inspected by PG&E before being covered.

2.21.6 Ground cables shall not be run in conduit trenches, unless otherwise indicated on the drawings.

2.21.7 Junction boxes, cabinets, cable trays, and conduit runs shall be grounded.

2.21.8 Ground cables shall not be installed closer than eight feet to other buried metallic pipes, conduits, or sewers. If this distance cannot be maintained, proper insulation must be applied to the ground cables.

2.21.9 Metallic enclosures for electric conductors shall be grounded. Couplings and connectors shall be made up so as to assure a continuous ground throughout the electrical system. The installation of bonding jumpers around insulating joints in conduit will not be permitted. Refer to PG&E Engineering Standard No. 067910 (Document 42 from Table 1).

2.21.10 Receptacles shall be grounded with a conductor of the same size as the circuit conductors.

2.21.11 After the completion of the installation of the ground cable network, the entire surface shall be restored to its state prior to construction. Excavated material not suited for backfill shall be replaced by suitable imported material. PG&E shall determine the suitability of the backfill to be used. Sand and backfill material shall be at optimum moisture content for maximum compaction. The Contractor shall supply water. Only hand operated, gas driven tamping equipment shall be used for compacting. Backfill shall be compacted in layers not exceeding 8 inches in depth to a minimum 90 percent density. The top 12 inches below grade shall be compacted in layers not exceeding 8 inches to a maximum of 95% of maximum density.

2.21.12 Extend all grounds (pigtails) a minimum of 5 feet above grade except as noted in drawings.

2.21.13 Contractor shall not connect any new section of ground grid to an existing ground grid until instructed to do so by a PG&E Inspector.

2.21.14 Operating Platforms: Special attention shall be taken when grounding switch operating platforms. This Work shall be done in accordance with PG&E's Engineering Standard 034851 (Document 14 from Table 1).

2.21.15 As theft deterrent, all exposed bare copper wire for grounding to equipment or structure (tails) shall be spray painted. Color shall be based on specific substation location, as

shown on Document 110 from Table 1, of the PG&E's Corporate Security Map. Provide a template made of cardboard or plywood to mask other surface areas from being over sprayed. Start spray painting bare copper ground conductor as it comes out of the ground (native soil surface). Spray paint the bare copper wire conductor and place blue painter's masking tape approximately 2 to 3 inches on the bare copper grounding conductor for personal grounds. Location of blue painter's masking tape on bare copper wire conductor shall be determined in field. Normally this is in close proximity of disconnect switches or other electrical clearance points. Remove blue painter's masking tape when dry. This will provide good mechanical contact of personal grounds to grounding conductor (tails). Avoid painting ground lugs as possible. Vehicles requiring grounding and other equipment are also clamped to this grounding conductor (tails). Crimp lug to the painted grounding conductor when dry. Connect ground lug to equipment or structure as required per grounding drawings. Do not spray paint any bare copper grounding conductor inside enclosures, junction boxes, panel boards, MPAC and Control buildings. Painting of bare copper grounding conductor shall also include exposed bare copper braided conductors. Do not spray paint exposed copper ground bar.

## 2.22 METALLIC CONDUIT

2.22.1 Conduit shall be hot-dipped galvanized steel or rigid iron. Threads shall be suitably coated with an approved zinc-rich paint. Minimum size conduit shall be  $\frac{3}{4}$  inch, unless otherwise indicated on the drawings.

2.22.2 The installation of steel conduit shall be made in a neat and workmanlike manner with runs of conduit aligned properly and accurately. Runs shall be installed in a straight line as far as possible. Unless otherwise indicated on the drawings, changes in direction of rigid steel conduit shall be made with long radius bends. Where two or more conduits are grouped in the same place, bends shall be concentric. Care shall be taken in bending not to flatten or injure the conduit. The proper size bending tools shall be used with corresponding conduit sizes. Parallel runs of embedded conduits shall be aligned with spacers. Any damage to galvanized surfaces will result in rejection of conduit by PG&E whether installed or in Contractor's storage. The removal and reinstallation of rejected conduit shall be at Contractor's expense.

2.22.3 Conduit shall be cut squarely and accurately, and ends shall be reamed carefully to the full diameter to remove burrs and sharp edges. Cuts shall be painted with a PG&E approved zinc-rich paint.

2.22.4 Threads shall be cut cleanly and truly with sharp dies. The dies shall be run over any conduit with damaged or defective threads. Threaded type connectors shall be used with rigid conduit. The ends of threaded conduit shall be screwed securely. Compression type couplings and connectors shall be used with EMT, flexible and liquid-tight flexible conduits.

2.22.5 When methods of support are not indicated on the drawings, vertical runs of conduit shall be screwed or bolted securely to the structure with approved clamps or brackets spaced not more than 5 feet apart, and horizontal runs of conduit shall be supported by means of approved hangers or supports at intervals of approximately 5 feet. Where groups of conduit are run horizontally in the same plane and the method of support is not indicated on the drawings, each support shall consist of a suitable structural steel shape of sufficient length and strength hung from the nearest suitable structure with two or more galvanized steel rods and bolts. Conduit shall be fastened securely to the horizontal supporting members. Bolts or screws fastened to concrete shall be secured with flush shells or anchor bolts.

2.22.6 Extreme care shall be taken to prevent obstructions of foreign material from entering any conduits. Contractor shall be responsible for expense involved as a result of obstructions of foreign matter encountered in conduit installed hereunder, including any damages to conduit wire or cables resulting there from. Exposed open ends of conduit shall be capped or plugged.

2.22.7 A combination of double lock nuts and an insulating bushing shall be used to terminate conduits except where a conduit terminates in a threaded hub.

2.22.8 Flexible conduit shall be installed so as not to interfere with the operation and maintenance of equipment. Flexible conduit runs shall be adequately supported and kept to a minimum as directed by PG&E.

2.22.9 No burning or welding of metallic conduit for securing purposes will be permitted.

2.22.10 Conduits shall be installed as shown on drawings.

2.22.11 Conduits shall be sealed with Duct Seal to prevent water from entering. For conduit penetration through wall, floor and ceiling that requires a smoke or fire barrier refer to Document 97 & 97A from Table 1.

2.22.12 Conduits shall be grounded in accordance with PG&E Engineering Standard No. 067910 (Document 42 from Table 1).

2.22.13 Conduits entering a cable tray shall be bonded to the cable tray.

2.22.14 Outdoors receptacles shall be marked with laminated nameplates to show voltages. Nameplates shall be installed with brass machine screws by drilling and tapping the receptacle cover.

2.22.15 Metallic conduit connections to outdoor junction boxes and cabinets shall be made using watertight connections.

2.22.16 Conduits shall be blown clean with compressed air and a mandrel pulled through prior to use or plugging.

2.22.16.1 Note: Before blowing out any conduits, always check the opposite end to make sure no damage could be caused by the potential high pressure water and debris exiting.

2.22.16.2 Never blow conduits towards energized or fragile equipment.

## 2.23 NONMETALLIC CONDUIT (DUCT)

2.23.1 Conduit buried directly in the ground shall be PVC Plastic Conduit, Schedule 40. Refer to PG&E Engineering Standard No. 062288 (Document 43 from Table 1) and Raceways for Low Voltage as well as Document No. 83 from Table 1.

2.23.2 Ducts enclosed in concrete envelopes shall be placed accurately and shall be aligned and so secured that they will not move when concrete is placed. Ducts shall be placed so as to offer the least obstruction to the placing of concrete. Iron wire shall not be used to fasten conduits.

2.23.3 Where not indicated on the drawings, ducts shall be installed so that the top of the duct or concrete envelope will not be less than 2 feet below the top of the finished ground level.

2.23.4 Unused or future ducts shall be plugged suitably as indicated on the drawings or in such a manner as will meet the approval of PG&E.

2.23.5 Joints in ducts shall be made with couplings without wrapping or dripping. Care shall be taken to see that the ends fit squarely and snugly into the couplings to prevent fine concrete from seeping into the ducts. Joints in adjacent ducts shall be staggered as far as practicable.

2.23.6 Extreme care shall be taken to keep small rocks, concrete, and other foreign material from entering the ducts while they are being laid. The open ends of ducts shall be closed with

temporary wooden plugs or rags between the laying of tiers and at such other times as duct sections are not actually being laid. Contractor shall be responsible for the expense involved as a result of obstructions or foreign matter encountered in the ducts installed hereunder, including damage to wire or cable resulting there from. Ducts shall be blown clean with compressed air and a mandrel pulled through prior to plugging or use. Ducts shall be protected during construction. Should any ducts become plugged, it shall be Contractor's responsibility to clean or replace them. All ducts shall have remaining in them; one  $\frac{1}{4}$ " polypropylene rope installed to aid in future wire pulls.

Note: Before blowing out any conduits, always check the opposite end to make sure no damage could be caused by the potential high-pressure water and debris exiting.

2.23.6.1      Never blow conduits towards energized or fragile equipment.

2.23.6.2      Underground conduit shall be placed in straight lines and shall be uniformly sloped between pull boxes or manholes (unless otherwise shown on drawings) so as to form a smooth raceway to facilitate pulling of cable and wire.

2.23.6.3      All underground conduits that cross roadways shall be capped with 6 inches of reinforced red concrete slurry mix.

2.23.6.4      Ducts not encased in concrete shall be accurately placed, aligned, and secured in a 3 inch compacted bed of sand. Sand shall be washed imported and approved by PG&E. Conduit runs shall be covered on top and sides with 8 inches of sand. Excavated material not suited for backfill shall be replaced by suitable imported material. PG&E shall determine the suitability of the backfill to be used.

2.23.6.5      Sand and backfill material shall be at optimum moisture content for maximum compaction. Contractor shall supply water. Only hand operated, gas driven tamping equipment shall be used for compacting. Backfill shall be compacted in layers not exceeding 8 inches in depth to a minimum 90 percent of maximum density. The top 12 inches below grade shall be compacted to layers not exceeding 8 inches to a minimum of 95% of maximum density.

2.23.6.6      All above ground non-metallic conduits shall be painted to aid in UV deterioration. Paint shall match the surrounding equipment.

2.23.6.7      Conduit penetrations through floor, wall or ceiling that requires a smoke or fire barrier, see Document 97 & 97A from Table 1.

## 2.24 TEMPLATES FOR CONDUIT

2.24.1      Where conduits are brought up through openings in concrete such as for switchboards, switchgear cubicles, control panels, pull boxes, etc., suitable temporary wooden templates shall be used to space conduits properly and removed upon completion of Work. Open spaces where conduit enters pull boxes shall be filled with grout.

## 2.25 CONDUIT DESIGNATIONS

2.25.1      Concrete pull boxes shall have the conduit designation stenciled with 1-inch letters on the inside before cables are installed. Junction boxes shall be stenciled with 2-inch letters on both sides and cover. Designations shall be applied as directed by PG&E. An oil base paint shall be used in stenciling. Black letters stenciled on a white background.

## 2.26 CABLE TRAYS

2.26.1 Cable trays, supports, and troughs shall be field cut and installed in such a manner as to leave no exposed raw edges. Raw edges and damaged surfaces shall be coated with an approved zinc rich paint.

2.26.2 Cable trays shall be drilled and supported as shown on drawings.

2.26.3 Cable tray shall be bonded at joints. Refer to Electrical Design Standard No. 448226 (Document 51 from Table 1).

2.26.4 For Cable Tray penetrations through floor, wall or ceiling that requires a smoke or fire barrier use Detail 3B of Document 97A from Table 1.

## 2.27 BUS EQUIPMENT

2.27.1 Care shall be exercised when handling bus equipment, with particular attention paid to protect porcelain insulating material. Equipment shall be properly supported, and no parts shall be subjected to strain or stresses that may damage them. Nylon slings shall be used to handle the equipment. Contractor shall not use any metallic slings, such as cables or chains, to handle equipment.

2.27.2 Bus bar angle and tubing shall be installed in a neat and workmanlike manner, as per drawings, and fastened securely in position. Taps to equipment shall be aligned accurately. Bends in tubing or piping shall be made by Contractor. Bus shall be cleaned thoroughly at points of connection to insure good electrical connection. Contractor shall also perform necessary tapping, punching, and drilling. Aluminum bus shall be heliarc welded, or as specified.

2.27.3 Prior to their installation and immediately prior to testing, porcelain insulating material installed hereunder shall be cleaned thoroughly by Contractor using clean rags with demineralized water.

2.27.4 Air switches shall be inspected, checked, lubricated, cleaned, and adjusted in accordance with manufacturer's recommendations and shall meet the approval of PG&E. After connections are made to air switches, a final check of adjustment shall be made by Contractor.

2.27.5 Whenever connections are made to aluminum, the joint shall be cleaned and a No-Ox-Id type compound shall be applied. Aluminum and aluminum to copper connections shall be made in accordance with Engineering Standard No. 037788.

2.27.6 Special finish of the bus tubing, special shielding and dimensioning of connectors, and particular care in the fabricating and shipping of the aluminum cable shall be specified in order to eliminate corona. Contractor shall take extreme care in handling and installing this equipment and shall be required to smooth welds, smooth cuts on aluminum bus, and remove burrs and abrasions as directed by PG&E. This care must also be used in handling the live parts of high voltage equipment, including air switches, power circuit breaker bushings, and lightning arrestors.

2.27.7 Bolted conductor fittings, couplings, connectors, etc., shall be installed, as far as practical, so that the nuts are "Down" or "Out."

2.27.8 Connections shall be made as shown on the drawings using the materials as specified. Work must be done to the complete satisfaction of PG&E.

2.27.9 Bolted bus terminals and connectors shall be torqued in accordance with the table given below. Engineering Standard No. 037788 lists the maximum allowable torques for the various size bolts based on the strength of the bolts. The torques recommended in the table below is

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based on NEMA standards and manufacturer's recommendations to obtain proper contact pressure. The torques recommended in the table shall be followed. Note that torque requirements depend on bolt size and whether they are lubricated (aluminum shall always be lubricated with NO-Ox-Id). Size-series and bolt material do not affect torque requirements.

Note: For torques not covered in Engineering Standard No. 037788, refer to manufacturers specifications.

Table of Recommended Torques for Aluminum and Silicon-Bronze Bolts and Nuts

Recommended Torque -- Pound-Feet (lb.-ft.)

++ Lubricated		Non Lubricated	
Bolt Size Inches	USA Size – Series	(For Aluminum or Silicon-Bronze)	(For Silicon-Bronze only)
3/8	Regular	14	+ 20
	Heavy	14	+ 20
1/2	Regular	+ 25	+ 40
	Heavy	+ 25	+ 40
5/8	Regular	+ 40	+55
	Heavy	+ 40	+55
3/4	Regular	60	70
	Heavy	60	70

+ NEMA Standard

++ No-Ox-Id is the lubricating medium

## 2.27.10 Torque Verification Procedure

2.27.10.1 First indicating mark: After initial torque settings, all bolts will be marked with a straight line using a permanent marker. This mark shall be on or near the bolt head or nut and easily visible from the ground.

2.27.10.2 B.4.9.10.2. Second indicating mark: Once all structures, equipment and conductors are assembled and have received their first torque line indication mark, a different individual shall once again verify these torque settings and place another line in the same location as the first, forming an "X".

2.27.10.3 B.4.9.10.3 Note: Bolts shall be given adequate time for stretching and equipment settling before rechecking torque values.

2.27.10.4 B.4.9.10.4. Sign off: Both individuals involved in these torque procedures shall be required to sign a check off sheet confirming these verifications were made.

2.27.10.5 B.4.9.10.5. Random testing: PG&E Inspectors will make random checks of torque settings. If any one torque value is found to be out  $\pm$  10% or more, Contractor shall be required to recheck all torques at Contractor's sole expense.

## 2.28 WIRE AND CABLES

2.28.1 Wire and cables shall be continuous from device to device. Wire and cables shall not be spliced or taped within conduit, cable trays or troughs.

2.28.2 Wiring shall be terminated with connector types in accordance with Engineering Standard No. 054552 (Document 32 from Table 1). Wire shall be stripped in such a manner that the conductor is not damaged.

2.28.3 Compression-type connectors shall be installed with an approved ratchet-type tool in accordance with Engineering Standard No. 054552 (Document 32 from Table 1). Compression type connectors shall be of the uninsulated type.

2.28.4 Wire strippers shall be of the fixed blade type (Automatic strippers).

2.28.5 Scotch-Loks shall only be used for connections on lighting and receptacle circuits.

2.17.1 Wire Size and Voltage	Approved Connector Type Uninsulated)
No. 6AWG and smaller, 600 volt and below	Double crimp (Terminations shall have ring tongue and crimping tool shall be used.)
No. 4 AWG and larger, all voltages	Burndy 4 bolt clamp type connectors wherever space permits, otherwise Burndy type 2 U-bolt connectors

Insulated cable may be pulled into conduits using PG&E approved pulling compound. Contractor shall not use soap, grease, or powdered soapstone for pulling compound. Grease shall not be allowed to come in contact with cable insulation.

2.28.6 Prior to pulling wire into ducts or trays, Contractor shall clean the entire length of each tray or duct. The cable shall be installed without injury and shall not be kinked or otherwise injured before or while being drawn into ducts or at any other time. While cable is being pulled into place, Contractor shall carefully observe the cable for damaged sections or defects; and damaged points shall be marked immediately and distinctly and referred to PG&E before continuing with the installation.

2.28.7 Each wire shall be tested for insulation resistance at 500 Volts DC (meggered), results documented, and its continuity proven before connections are made and marked or tagged at terminals with approved PG&E markers. Each marker shall bear PG&E's circuit and wire designations. The terminal points to which external wiring connections are made shall be so marked. Spare wires shall be tagged "spare" with identification as to termination. Special care shall be taken to assure that no control wiring is megger tested after connection.

2.28.8 Control wire and power cables in pull boxes, junction boxes, and cable pits shall be tied and neatly racked on the sides of the boxes in a manner approved by PG&E. This shall include installing the necessary galvanized hangers and racks, etc., designed to provide proper support for the wire or cable without injury to the cable. No wire is to be pulled prior to installation of hanger racks. When hanging wire in pull boxes, the bundles shall be routed the longer of the two possible routes. When wire enters a junction box, the wire shall make a loop in the box prior to exiting. In the terminal cabinets of outdoor equipment, the wires shall be looped in such a way that if necessary, the ty-wraps could be cut and any wire could reach any termination point in the cabinet. After completion of wiring, conduits terminating outdoors shall be sealed with Duct Seal.

2.28.9 When pulling control cables from outside equipment into energized control rooms, Contractor shall coordinate with PG&E's Senior Inspector prior to initiating. When possible, Contractor shall pull all circuits to their termination location, megger with a 500VDC megger, ring-out individual conductors, identify with wire markers, and terminate. Megger results are to be documented and a copy provided for the Senior Inspector. Note: After installation, wire

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markers must be protected to prevent damage to nomenclature.

2.28.10 No circuit shall be pulled into an in-service or energized equipment cabinet by the Contractor without first coordinating with the PG&E Onsite Inspector.

2.28.11 Plastic wire ties (Ty-wraps) shall be locking type or an approved equivalent.

2.28.12 Plastic wire ties must never be attached in such a manner that they will be pulled into conduits.

2.28.13 As far as practicable, wire shall be laid parallel and straight.

2.28.14 Ty-wraps or approved equivalent shall be used for bundling with spacing between tie points of approximately 8 feet.

2.28.15 During pulling operations, wire and cable shall not be pulled over ground or floor without suitable protection from damage.

2.28.16 To fully take advantage of the sourcing efforts and benefits already in place PG&E prefers to have wire and cable for projects procured through:

Southwire

One Southwire Drive

Carrollton, Georgia 30119

Tel (770) 832-5023

Fax (770) 832-4812

Contact Person: Steven R. Campbell

Email: steve\_campbell@southwire.com

## 2.29 WELDING

2.29.1 Welding performed hereunder shall comply with the applicable requirements of the codes and standards for arc and gas welding in building construction, as published by the American Welding Society, and shall meet the requirements of PG&E Specification 81 (Document No. 11 from Table 1).

2.29.2 Prior to welding, parts shall be cleaned of oil, grease, and dirt by use of a suitable solvent. Surface oxides shall be removed from the joint area with a steel brush or clean steel wool immediately prior to welding. Prepared areas shall be approved by PG&E before welding begins. Welds shall be cleaned and wire brushed after completion.

2.29.3 Workers performing aluminum and/or mild steel welding must be certified for the class of Work to which they may be assigned. PG&E inspector shall qualify welders by random sampling. All welding on conductive buses must be done by welders certified by PG&E at its San Ramon facility. This shall be done at Contractor's expense."

2.29.4 Aluminum angle bus, tubing, and fittings shall be heliarc welded, or as specified.

2.29.5 Welding procedures shall be submitted to PG&E for approval. Procedures must comply with PG&E standards.

2.29.6 Main Transformers and High Voltage Circuit Breakers shall be welded to embedded steel.

## 2.30 PAINTING

2.30.1 Equipment which is furnished already painted or finished by the manufacturer and which is marred or scratched during installation shall be touched up by Contractor with an approved primer after installation.